

OS/2

M A G A Z I N E

Test Drives

AntiVirus/2

Galleria 2.1

Get Inside Your PC

Incremental Hardware
Upgrades Keep Your
OS/2 PC Current

Game Playing

How to run pesky DOS and Windows games

Organize Your Work

Using the Workplace Shell to
enhance your productivity

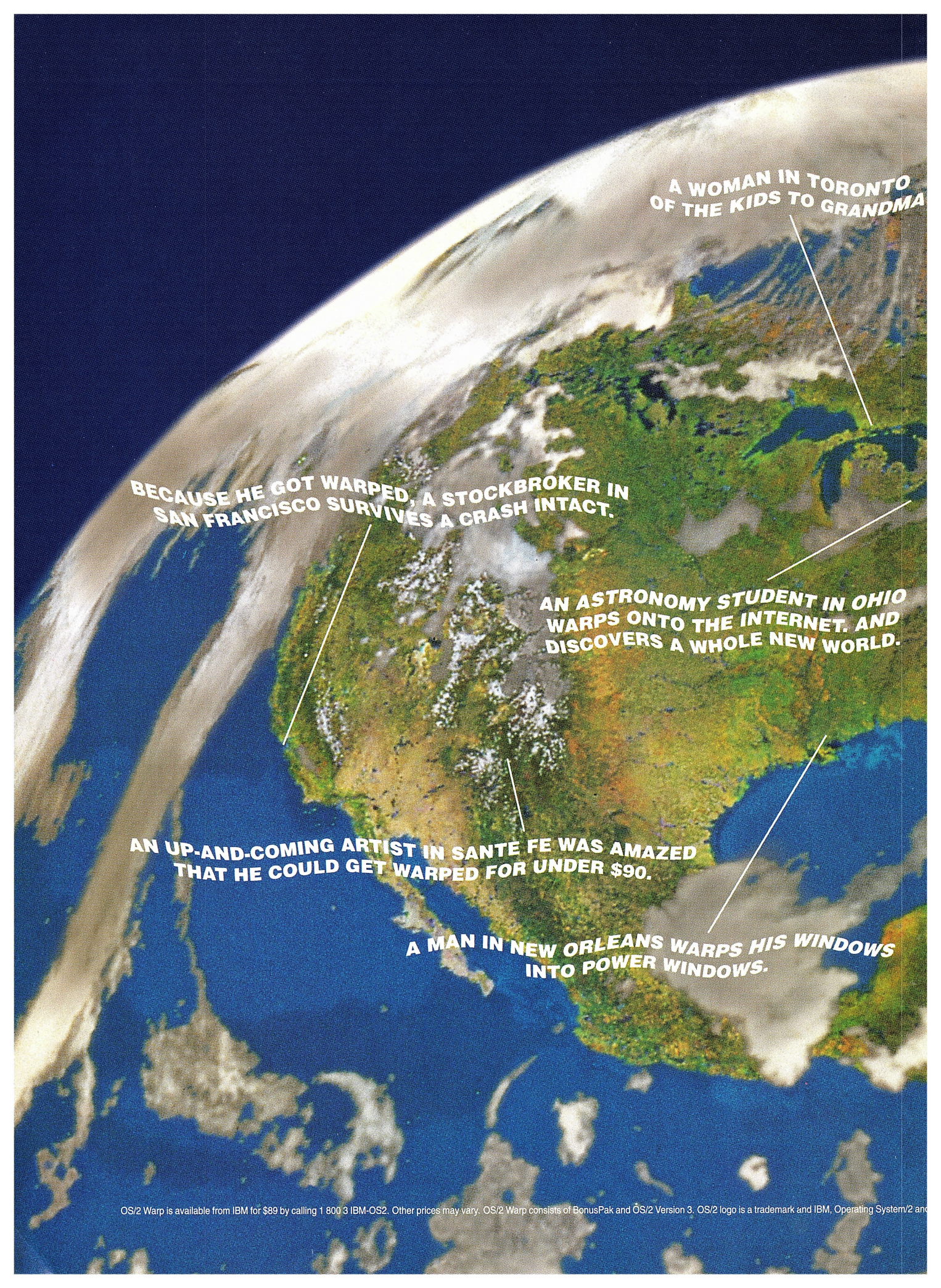
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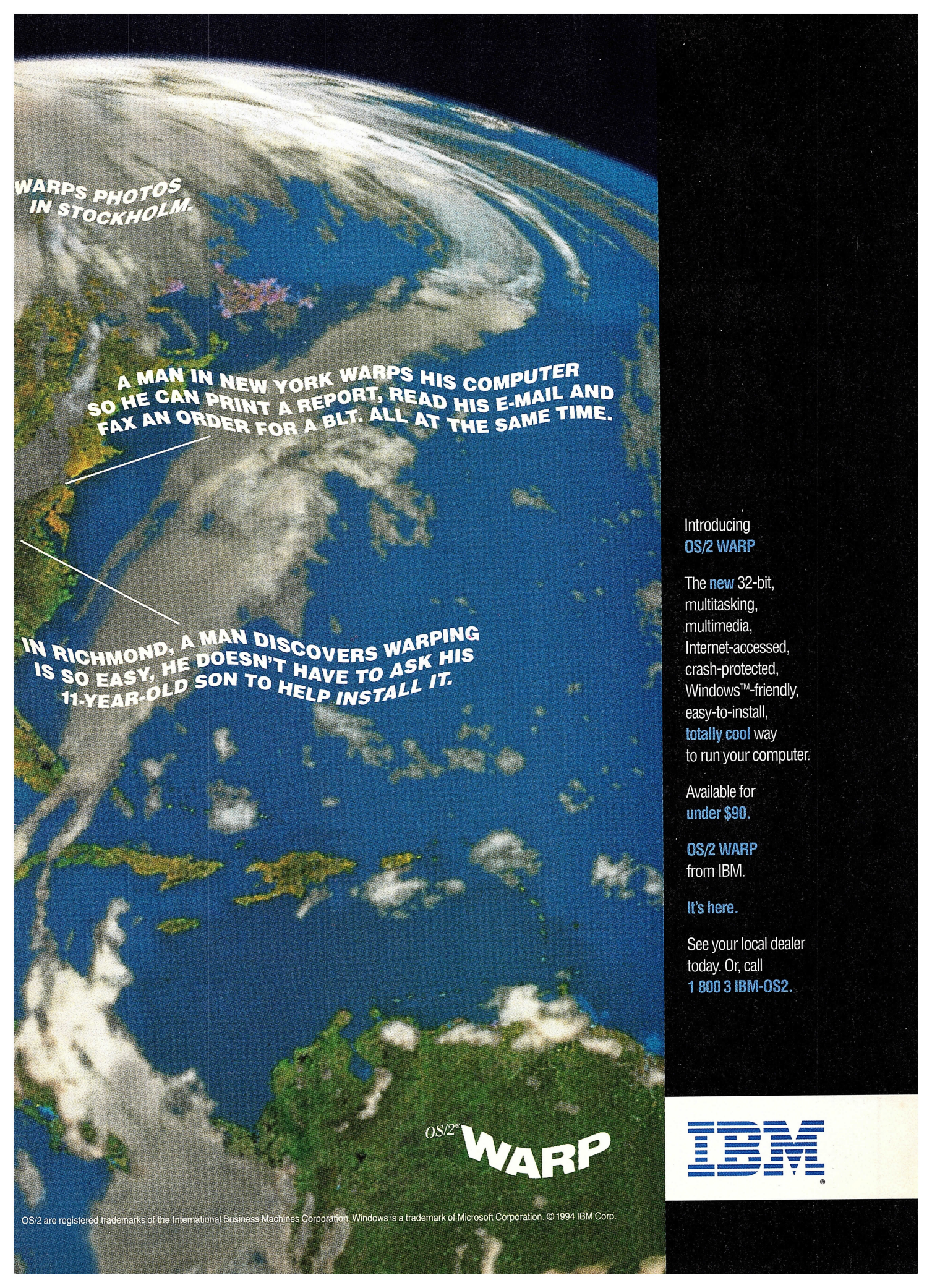
**A WOMAN IN TORONTO
OF THE KIDS TO GRANDMA**

**BECAUSE HE GOT WARPED, A STOCKBROKER IN
SAN FRANCISCO SURVIVES A CRASH INTACT.**

**AN ASTRONOMY STUDENT IN OHIO
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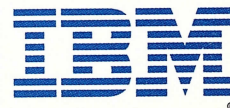
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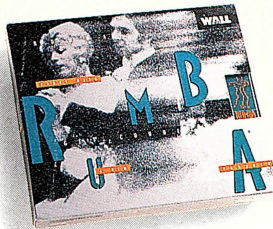
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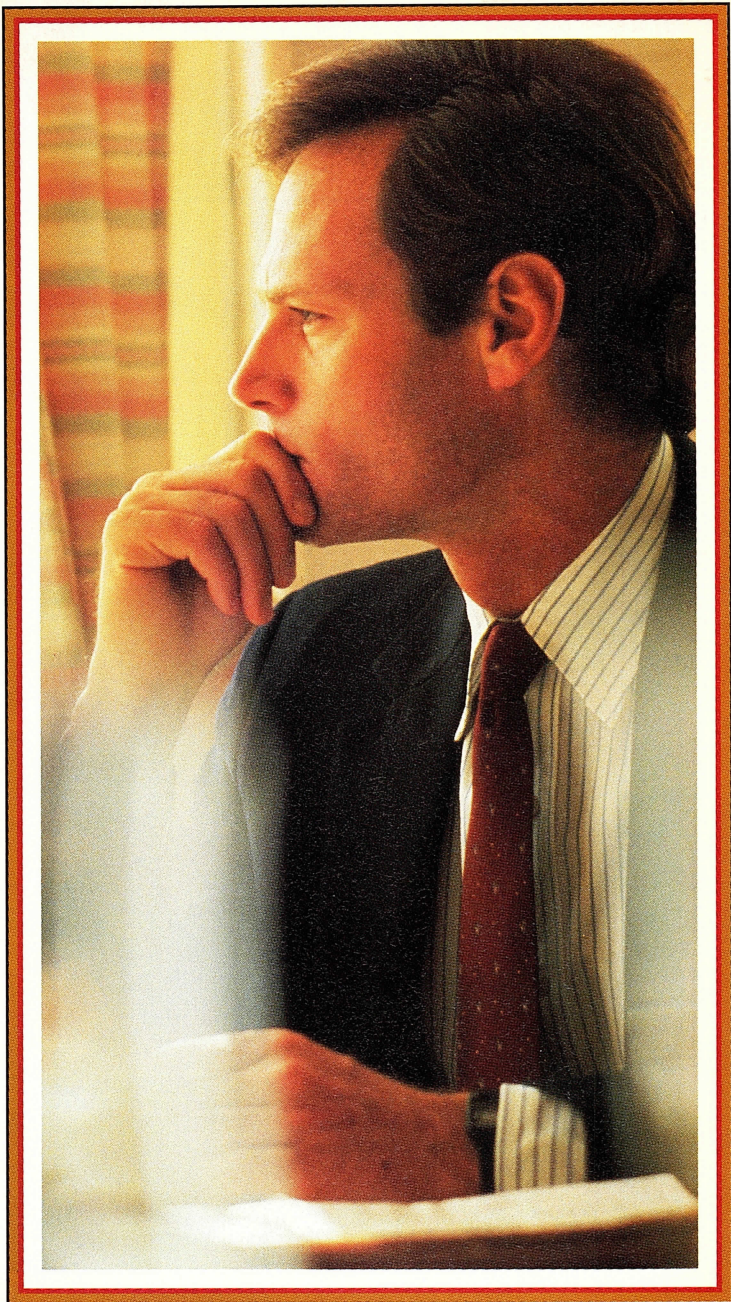
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Perspectives

The Name Game

If you've been shopping for a new car lately, you know that many of today's models have nonsensical names like Achieva, Allante, Altima, Cressida, Impreza, Passat, Previa, and Prizm. It wasn't so long ago that most cars had memorable names that reflected something of their personality. You know, the untamed Mustang, frisky Colt, high-flying Thunderbird, graceful Skylark, smooth Sable, popular Celebrity, pace-setting Tempo, stately New Yorker, sweet Concord...okay, okay, I'll stop.

Seriously, it's unfortunate that PC hardware has started down the road of indistinguishable brand names seemingly inspired by Detroit: Ambra (both IBM and Zeos make computers with this name), Ascentia (AST), Axcels (Packard-Bell), Centris (Apple), Contura (Compaq), Globalyst (AT&T), Pantera (Zeos), Premia (AST), Presario (Compaq), and Virage (Altima).

Operating systems long resisted this trend towards vague blandness. DOS is the Disk Operating System. Microsoft's Windows highlights the windowing metaphor. OS/2 is Operating System Number Two. And as these operating systems evolved, they used the standard *major.minor* version numbering system: DOS 4.0 was a major (and very buggy) upgrade over DOS 3.3, and DOS 4.01 was a minor upgrade to fix DOS 4.0's bugs. Everything seemed so orderly. And magazine editors crave orderliness.

Alas, over the past year, and in particular the past quarter, it seems that software marketers have decided to use operating system and application version numbers as marketing weapons. My favorite example is Microsoft's decision to label the major upgrade of Word 2.0 for Windows as Word 6.0 for Windows, so as to achieve numerical parity with WordPerfect 6.0 (or as WP prefers, Six.0).

Then came the DOS wars. Microsoft brought out MS-DOS 6.0. IBM retaliated with PC DOS 6.1. Microsoft moved ahead with MS-DOS 6.2. And then IBM released PC DOS 6.3, which is clearly the newest version of that venerable operating system, at least until Microsoft introduces MS-DOS 6.4.

Let's talk Chicago. A major rewrite of Microsoft's Windows 3.x, everyone expected it to be called Windows 4.0. Journalists, myself included, even referred to the unannounced product in print as "Chicago (Windows 4.0)." *Wrong!* In early September, Microsoft announced that Chicago's true name is "Windows 95." (Huh?) Microsoft claimed that customers were confused, and therefore needed a better way to determine the latest version of the operating system. It's enough to drive an editor nuts.

You know, the last software that I recall seeing labeled with a year was Adobe's Illustrator 88. It was

soon followed by Illustrator 3.0, 4.0, and 5.0, so it's easy to judge the success of *that* strategy.

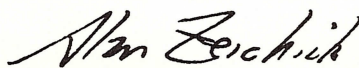
And then there's the latest revision of OS/2. Within IBM, there was much controversy right up to the October 11 announcement: Should it be called OS/2 3.0 to indicate a major upgrade (but possibly scaring off customers afraid of X.uh-oh releases)? Or should it be called OS/2 2.2 to properly reflect the minor changes in the base operating system (but surrendering the marketing punch needed to capture customers from Windows 4.0)? Or should it be called "Warp 3.0," to bring it's Star Trek-inspired code name to life and thus appeal to science-fiction fans? You know which option won. Will the next OS/2 be called "OS/2 96" or "OS/2 Wormhole 4.0?" Your guess is as good as ours.

A bigger problem is the practice of hyping unannounced products, sometimes for years, using code names, rubber schedules, carefully constructed half-promises, and other evasive tactics. How do Bill Gates's Chicago, Daytona, Cairo, and Snowball compare with Lou Gerstner's Borg, Ferengi, Warp, and Klingon? If IBM and Microsoft are intending to confuse their customers, they're succeeding.

Look, folks: Either announce your product, or don't announce your product. It's like politicians saying that they're not candidates for the Senate, but they'll be announcing their candidacy next week. That type of doublespeak is a sure way to lose votes. It's just that simple.

Enough of this "Warp" and "Chicago" nonsense! Stop showing code-named technology at trade shows hyping its marvelous features, and then release products, months or years late, that barely resemble those much-ballyhooed demos. Don't tease us with unstable public beta releases, but concentrate instead on shipping bullet-proof code. Cease driving consumers crazy trying to figure out if they should buy Warp or wait for Chicago, when both "unannounced" products are constantly moving targets. That does not engender goodwill from anyone.

Try this unusual strategy: First, develop your new product. Quietly test it with a select group of competent beta-testers. Then, announce and promote the product when it's finished. If we like the product, and it's a good value, we'll buy it. What a novel concept.



Alan Zeichick
Editor-in-Chief



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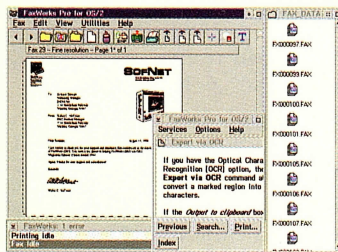
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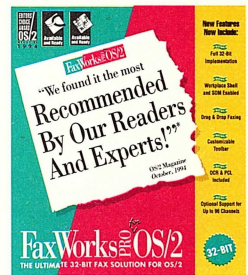


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Letters

WordPerfect 6.0a test drive

I appreciated Brian Proffitt's excellent review of WordPerfect 6.0a (September 1994, pp. 18-23). I was beginning to think I was the only one who saw the benefit of the OS/2 Integration Tools, especially for companies that have large installed bases of WordPerfect. I have encountered one problem with the OS/2 Integration Tools. The automatic document detect corrupts LAN file names. I suspect it is attempting to change the Workplace Shell settings. I am using IBM LAN Server, IBM LAN Requestor, OS/2 2.11—all the latest versions—so it really seems to be a WordPerfect problem.

John Huntjens
via CompuServe

Thanks for the kind words, John. I haven't heard of the problem of file corruption over LANs. I strongly suggest you check with WordPerfect support on that one.

Brian Proffitt

Dear Editor,

Eric Pinnell's "At Your Command" (August 1994, pp. 33-37) failed to include some important aspects of running OS/2 without the Workplace Desktop. He is correct in that changing the **protshell** and **runworkplace** statements to = **cmd.exe** will result in a system hang when ending a PM program. That problem can be avoided by changing only the **runworkplace** statement to = **cmd.exe**. Leaving **protshell** = **pmshell** will result in the window list and a windowed session titled Workplace Shell to be opened. Additional DOS, OS/2, and PM sessions can be opened using the **start** command. PM programs will then behave properly. In addition, it's possible to start the Workplace Desktop by running **pmshell** again from the Workplace Shell command prompt. If you run a utility such as *running2.exe* that

displays all processes, you'll find two **pmshells** running. It's even possible to remove the Workplace Desktop with a utility, such as *slay.exe* by ending the **pmshell** process with the highest PID number. This utility has given me a way of accessing all the functionality of OS/2 2.1 while limiting access or reducing overhead when necessary.

Ben Semionow
Toledo, OH

Uninstalling tips

Dear Editor,

I installed OS/2 2.1 and DOS/Windows (DOS 6.2) on a 200MB hard drive (a Zeos 50MHz 486). I use Windows and OS/2 very little, but I want to upgrade and learn OS/2. I am currently using OS/2's Dual Boot feature and am about to add a 420MB hard drive.

The OS/2 documentation (which I rate as poor) does not include a scenario for setting up or installing OS/2 on a two-hard-drive system. Do you know an easy way to "uninstall" OS/2 that will remove everything? If not, what are all the directories (besides OS/2 and its subdirectories) that can or should be deleted? Should, or can I repartition my 200MB drive (c:) with a 1MB to 2MB partition for bootup and install OS/2 on the new 420MB drive? Would I be better off making drive c: the 420MB drive? (I plan to use Boot Manager.)

Bruce Birr
USDA Forest Service

How can you uninstall OS/2? Use attrib to find, unhide, and remove the system and read-only attributes from any and all files in the root directory. Boot from the OS/2 disks. Erase all files in the root starting with os2, and the \os2 directory. Remove the \spool, \desktop, and \nowhere directories, and \mmos2 (if it exists) and all of their contents. You must do so while booted from an

OS/2 disk so all file extended attributes are removed.

I suggest you make the new 420MB drive the first drive. Install boot manager before anything else. At the beginning of free space, create a bootable partition for OS/2 after it (c:), install OS/2 there, and create a data/program partition after that (d:). You can move things from the 200MB drive and repartition it later. You won't need to worry about uninstalling OS/2, because you'll probably repartition it away later.

David Reich

Enhancements to tips

I found the "76 Tips" (pp. 24-36) and the "Tips & Tricks" column (pp. 67-70) in the September issue very useful. However, I have a couple of suggestions.

In Tip 22, you pointed out that when prompting for a response in an object's Settings, a question mark will pop up a window that allows you to enter a value that will be passed to the application when it starts. If you enter a string surrounded by square brackets, the popup panel will contain the message you entered. For example, you could enter <name of spreadsheet> and the instruction will appear on the popup, making it clearer what the application needs.

In David Reich's "Tips & Tricks" under the heading "Viewing On-line Help," you could also add that the .inf extension is not mandatory when calling an .inf file using *view.exe*. If you omit the extension, View will automatically look for a file with the .inf extension using the entered name. View will also accept title strings as a parameter during startup. This way, you can go directly to a particular chapter in the document (this is how *help.cmd* calls the OS/2 Command Reference, for example).

Mark Gayler
via CompuServe



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Mo' Beta Blues

ARE CURRENT "BETAS" A REAL TEST VEHICLE OR MERELY A MARKETING GIMMICK? BY BRIAN PROFFIT

The software release process has finally come full circle. In the early days of personal computing, most software was written by one or two people who worked in their homes. They distributed it freely in various stages of completion and the users, hungry for any new software, began to use it immediately and report back to the developer on any bugs they found. The developers fixed them, when possible, and put out a steady stream of updates.

As the industry matured, so did the product development and release process. Vendors grew in size, allowing them to devote more people to product testing. Customer expectations rose and the critical eye they applied to new products became sharper. As developers began to use more refined and professional development techniques, their test processes also became more clearly defined. In addition to the testing each individual developer performed on their code before releasing it, three formal test phases began to be used.

Testing, testing, testing

Alpha test is essentially the first round of testing done by a developer or development team once they decide that their individual piece of the final product is complete. The application as a whole may not have all of its pieces in place, but enough pieces are complete to begin testing their interaction. This phase is usually restricted to internal testing for major vendors, but smaller vendors may ask a few key customers to help.

A product that enters beta test

should contain all features that are expected to appear in the final product. All gross bugs, such as those that frequently result in data loss or a total crash—should have been removed. If beta testing takes longer than three months, the product was released into beta too early. It was still alpha-level code and the vendor was misleading everyone by pretending otherwise.

At the other extreme, beta tests should run a minimum of two weeks. However, such a short period is acceptable only if a significant number of testers (with widely varied backgrounds and configurations) are dedicated to thoroughly stressing the code, and enough programmers are available to resolve the bugs found.

Regardless of the length of time, if many of the modules in the code are changed (no matter how slightly), another beta test should be undertaken. It's too easy for a fix to have unforeseen effects on another part of the application.

Finally, depending on the number and severity of the problems found during beta testing, a vendor might conduct a brief gamma test. This code is a candidate for release as the final product if no significant bugs are found. Yes, I did say *significant* bugs. Most software products are released with known bugs. The vendor makes a decision to ship the product based on the severity of the bugs and the percentage of customers who are likely to find them. That's why the x.0 release of any product is usually followed quickly by an x.01 or x.0a release that contains fixes. The number of people

who participate in gamma tests are kept to a minimum to minimize the duration of the test and get the product out the door as quickly as possible.

These test phases allowed the vendors to feel confident that they were putting out a quality product *before* the public saw it. They protected their image of purveyors of stable programs by not telling the public about those applications until they were complete and ready for shipment.

Unfortunately, while development techniques have continued to improve, many vendors have lost sight of the original purpose of the test cycles, or they have allowed their marketing departments to persuade them to use those tests for different purposes. Once again, they are releasing code that is far from being complete and is full of known problems. There is a growing trend toward opening beta programs to more people and announcing them earlier. In many cases, this approach has become nothing more than blatant market manipulation.

Promises versus products

At the end of 1993, I wrote that IBM needed to get the OS/2 message out more clearly or some of the folks that needed a 32-bit preemptive multitasking operating system right away might wait around for Chicago (See "Why OS/2 2.1?" December 1993, p. 32). The first Chicago beta was several months long and the second is a similar stall tactic with many parts still missing. The goal was to keep people from looking too closely at OS/2 2.1 by fooling them into believ-

ing that a new Windows version was right around the corner.

In fact, during the 15 months during which IBM released OS/2 (and OS/2 for Windows) 2.1, 2.11, and 3.0, the only thing Microsoft has released is Windows (and Windows for Workgroups) 3.11, whose salient feature over 3.1 was a blockade to prevent OS/2 for Windows from being installed over it. IBM has overcome that blockade in OS/2 3.0. (For a timeline of OS/2's releases, see "Information Center," pp. 70-72.)

Despite this, Microsoft's public posturing has been so successful that many people are still waiting for Chicago—more than a year later. (Microsoft has finally admitted what we all knew; Chicago, now officially named "Windows 95," is targeted to ship in "the first half of 1995," which probably means June. Isn't it interesting that Microsoft Press' own Computer Dictionary defines beta test as "one of the last steps a software developer takes before releasing the product to market" when they began a beta test a full year before shipment?)

IBM is not above reproach either. Were the new features that IBM introduced in the Warp II "beta" a pleasant surprise? Perhaps, but they were introduced too late in the cycle, and caused a regression in stability from Warp I. Announcements have been made about features that are supposed to be included in OS/2 3.0, such as Internet connectivity, that were not even present in Warp II. Those additions (which should have been made before entry to the first beta stage) forced IBM to either ship OS/2 3.0 later than they had planned or ship it with inadequate test and fix time.

Why no Warp beta review?

Perhaps you now understand why *OS/2 Magazine* will not review products that are still being beta tested. Many publications do so in order to "scoop" their competition, boost

newsstand sales, or create false excitement in the marketplace. However, this kind of journalism does the readers and vendors a disservice. Remember that by definition, a product in beta test is not finished. It may not even resemble the final product that hits the shelves.

If we had printed a story based on the Warp I beta of OS/2 3.0, there could have been no discussion whatsoever of major features, such as the Bonus Pak and the Launch Bar, because they weren't in the product yet. As I write this, people are speculating about how many more features may change between Warp II and the final product. New features, such as Internet access tools and IBMWorks, have been announced for the final product but aren't present in what has been proclaimed to be the final beta. This perverts the definition of beta test, puts the final product at great risk of further regression instability, and misleads the people beta testing the product. If we wrote a review of this beta, we could impact public feelings based on a false understanding of the product that they might end up buying—or not.

If we praise the product at this stage, readers might conclude that we're acting as the vendor's public relations vehicle. (Remember all the controversy over the media's widespread coverage of NT before its shipment? The reality hasn't lived up to the advanced hype.) If we pan the product (as we would be forced to do if we wrote a review of Warp II), we would be unfairly picking on unfinished code.

Open availability of early buggy code does not qualify as a beta test. It is another market-control tactic to try to keep as many people as possible excited about the product. IBM didn't do itself any favors in releasing Warp II. Many of us have been forced to remove it from our machines and go back to a more stable platform. What message does that communicate to customers?

A beta test is a phase in which a small qualified group of people are given code with the expectation that they will produce bug reports on a regular basis. If every one of the thousands who received Warp II (and paid IBM, CompuServe, and/or the phone company for the privilege) filed a single bug report weekly, IBM's development team would be totally overwhelmed by tracking them. In this case, IBM is counting on their assumption that those "testers" will not, in fact, report problems.

It's easy to say that the more people you have testing your product, the more likely you are to find and fix all of its problems. However, that is only true if those problems are actually reported and you have the staff to address them. CompuServe's PSPBETA forum shows the long public history of problems people have found in OS/2. Instead of being able to keep those problems contained internally, IBM is faced with the challenge of fixing every one of them or admitting to shipping code with problems known to have been reported to them.

The entire industry has been buzzing lately over the news of the Federal Trade Commission's ruling on Microsoft's agreements with hardware manufacturers. If vendors don't begin policing themselves, government agencies may become interested in other practices that are clearly misleading and deceptive. Any product that is announced (whether officially or leaked) more than a year before it is shipped falls into this category, as does any product whose final version doesn't look like the product that was shipped to the world in an open "final beta" test.

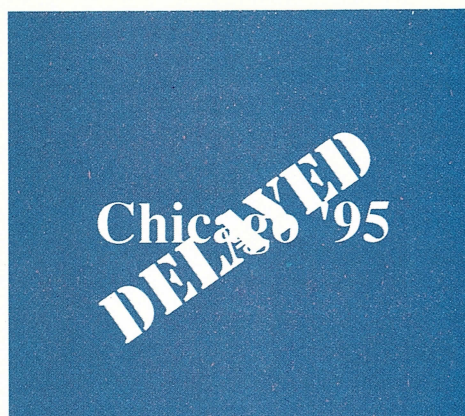
We have WYSIWYG (What You See Is What You Get) user interfaces on our computers. Now, if we could only get WYSIWYG announcements and tests from the vendors.

Brian Proffitt is a contributing editor to OS/2 Magazine.

Three-O.



Uh-Oh!

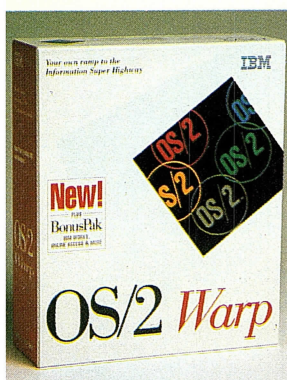


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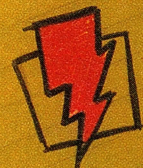
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Advances in Technology

THE TRICK IS TO FOCUS ON THE PRACTICAL APPLICATION, NOT THE GLAMOUR **BY AMY D. WOHL**



Businesses are constantly being pressed to take advantage of technological advances. In fact, vendors whose success depends on sales of their technology are happy to provide these companies with portfolios of optimistic stories about happy and successful businesses who have been quick to adopt new technologies (especially theirs).

Doomsayers (myself included), can be counted on to recount tales of what happens to technologically lazy organizations. These companies are sure to be outpaced by competitors and eventually eliminated. It is not exactly clear how you can tell a significant technological advance (one worthy of surviving the intervening chaos and taking on the unpredictable risk) from a technological frill. Anyone who buys, uses, or supports today's computers can tell you it isn't easy.

We are being bombarded by technology on every level, from peripherals and systems, to their underlying components. Operating systems, communications infrastructures, and the architecture for relating system elements are in a state of constant flux. We are in the process of making major changes to every part of our computing strategy. But, most customers don't pay attention to physical and logical manifestations of the continuing and compelling pace of technology. Instead, they focus on the applications.

The changes being made to applications software are seductive, but difficult to categorize. Customers want everything to be as integrated as possible, so that interfaces are familiar, everything works together, and the software cooperates in an efficient and productive way. You might keep and use the slightly less glamorous graphics package that came with your office suite, in the interest of good family relations, instead of swapping it out for a fancy, but less integrated, separate package.

We demand that software be written with good, crisp, standard interfaces, so we can combine our choice of software applications, building our own custom suite. Such a suite will never have the same degree of integration as Microsoft's Office, Lotus's Smart Suite (the one you can buy for OS/2), or Novell's PerfectOffice, but it will have flexibility and freedom of choice.

A growing body of software, called Groupware, is designed to help facilitate the efforts of groups or teams of people working together. Groupware seems particularly well-suited to an electronic age, because time and geography can easily be ignored.

The preeminent product of this type is Lotus Notes, which has nearly a million users. Notes is very OS/2-friendly, supporting both OS/2 servers and clients. It also has a broad cross-platform strategy that

supports UNIX and NetWare NLM servers and Windows, DOS, Mac, and UNIX clients. But, you must load (which is tough to do), connect (which is easy enough to do on a LAN, but much harder to do remotely), and support a Notes environment.

Other vendors are building their own Notes-equivalent environments—from pieces of Notes (for example, Collabra and DCA's Open Mind), to full-blown environments (such as Microsoft Exchange and Novell GroupWise—formerly WordPerfect Office). Some interconnection (if it is done gingerly) seems possible.

In the relentless advance of technology, we are moving toward personal applications that are more automated, providing users with intelligent servants (or agents) to do their bidding. At the same time, we are adding more workgroup software—not only the facilitating software of Notes or the communicationsware of e-mail, but the transaction-processor of the 21st century office, WorkFlow.

An environment, such as Notes, with its own graphical user interface (GUI) and its ability to put anything (including voice, graphics, and video) into a shared file or custom application quickly stresses ordinary hardware. Users are constantly upgrading their hardware to support their software. People who use Notes have been encouraged to buy faster modems, higher perfor-

The Big Picture

mance systems with more memory, and better displays. Many other packages are similarly greedy. Of course, better hardware enables even better software. It's a vicious—but seductive—cycle. The user occasionally needs to ask the question, "What am I getting out of all this?"

Better help with getting information

Color, graphics, video, and voice can be used to provide additional levels of information about the subject at hand. Or, it can help the user to find information in a complex information space. I received an e-mail message from someone who suggested that we need new interfaces to help us organize information, as well as to navigate. In one of the dozens of newsletters I receive each month, someone made an excellent suggestion. They requested that someone build an

Internet interface that provides a single hierarchical view of the Internet and its myriad of information for those of us who prefer to think that way.

Better quality information

Automated tools can scan on-line services and remote databases, seeking information that you have neither the time nor skills to find. Other tools can combine, manipulate, refine, and display that information for you, alerting you only when particular conditions occur or boundaries are met or exceeded. Visualization tools permit business problems to be graphed, work processes to be charted, and the flow of work through your organization to be optimized. Brainstorming tools enable creativity. Group decision tools can facilitate group thinking and speed up group decisions.

It's up to the user to decide whether expenditures on comput-

er hardware, software, training, consulting, and support is a wise business investment. An objective manager will consider not only the cost of the new technologies and their possible return, but the alternative investments in other technologies, buildings, new businesses, information, and people.

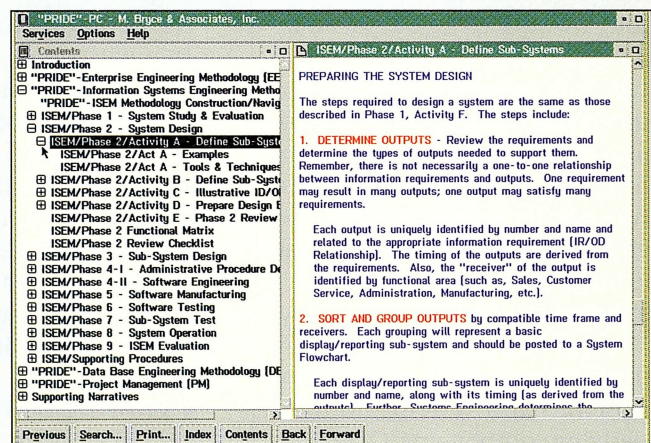
Wise investments in technological advances on a timely basis can make the difference between success and failure in the marketplace. A keen eye for the difference between toys and tools will continue to be of greater importance than the speed of a processor or the newest trick in interface design.

Amy D. Wohl is president of Wohl Associates, a consulting firm specializing in office information systems, personal computing, and end-user computing. She is also editor of the Trendsletter, a monthly newsletter on computer industry trends.

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Survival? Or Victory?

LIMITED SUCCESS FOR CHICAGO MIGHT LET OS/2 WIN THE OPERATING SYSTEM WARS BY WILLIAM F. ZACHMANN



IBM assumed complete responsibility for OS/2 in late 1990. Each year, OS/2 has moved into a better position than it was in the year before. The beta versions of OS/2 2.0 that were in circulation by the end of 1991 already gave a hollow ring to the "OS/2 is dead" claims that were being made by most industry pundits. By the end of 1992, the production version of OS/2 2.0 had already shipped more than one million copies. By December 1993, the improved 2.1 version and the surprise release of OS/2 for Windows had been shipped, bringing the number of copies of 32-bit OS/2 that had shipped close to five million.

As 1994 draws to a close, Warp (also known as OS/2 3.0) has given OS/2 another substantial boost, and 32-bit OS/2 is closing in on the 10-million-copies-shipped mark, which is roughly equal to Windows 3.x's climb during its first two and a half years.

At this point, even Microsoft chairman Bill Gates no longer dares to claim that OS/2 is dead. OS/2's harshest critics and most dedicated opponents have been forced, grudgingly, to admit that OS/2 is, at the very least, a viable product. Even if they claim that it will only succeed as a niche product, at least they recognize that it is sure to have some measure of success. OS/2's increasingly numerous fans, of

**At this point,
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chairman Bill Gates no
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that OS/2 is dead.**

course, have a much more upbeat view of the matter.

Now that virtually everyone—friend or foe to OS/2—agrees that OS/2 will survive the 32-bit OS Wars of the 1990s, it's time to ponder a much more interesting question—whether OS/2 might not, after all, end up the outright winner of the OS Wars. Admittedly, that still looks like a long shot. After all, Microsoft Windows 3.x has the enormous advantage of high installed-base figures. Most software developers continue to focus their efforts on Windows. Daytona has breathed a bit of life back into NT. And the world still eagerly awaits (if you believe the mainstream computer magazines) the arrival of Chicago. Microsoft's various delays and minor stumbles might leave the window open long enough for OS/2 to become a stable minority option, but it's a long way

from triumph over the potent forces of "Windows Everywhere!"

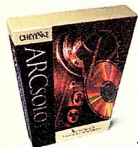
The distance, however, is nowhere near what it was one, two, or three years ago. The odds may still favor Microsoft's various flavors of Windows over OS/2, but the triumph of "Windows Everywhere" is no longer the "sure thing" that nearly everyone assumed it would be (or that many continue to assume it is). On the contrary, the possibility of outright victory, in the end, for OS/2 is now not only thinkable, but reasonably plausible. Scenarios by which OS/2 wins the OS Wars are no longer very difficult to imagine.

The easiest, although not necessarily the most likely scenario to envision, isn't one where OS/2 (and IBM) simply battles to win, but one where Microsoft (and Chicago) can't help but lose. A serious stumble on Microsoft's part with Chicago could make it possible for OS/2 to win the day. Although it is not an overwhelmingly likely scenario, it shouldn't be dismissed.

Leading the horse

Microsoft's preferred "mental model" for the transition from Windows 3.1 (or 3.11) to Chicago (or Windows 95) is that it should be as similar to the 1992 transition from Windows 3.0 to Windows 3.1 as possible. It should be a routine and painless transition for the user

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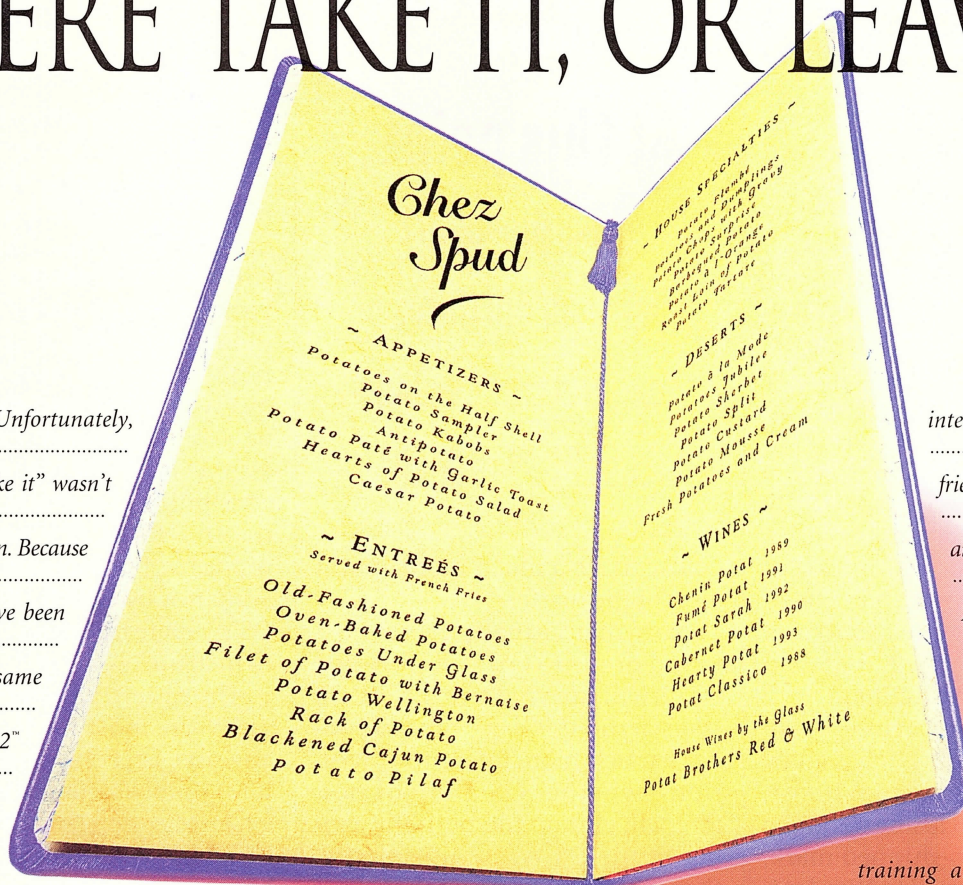
hasn't exactly

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with a clean and complete cut to the new version, allowing the old version to be dropped as obsolete. Unfortunately for Microsoft, the inescapable reality is that the move from Windows 3.x to Chicago is a very different and fundamentally more difficult transition than it was from Windows 3.0 to 3.1. Chicago is more radically different from Windows 3.1 than 3.1 was from 3.0.

Chicago's architectural roots remain tied to the structure (and limitations) of Windows 3.x, but Chicago is also an extremely ambitious effort to graft on the multithreaded, multitasking, Win32 API capabilities of NT. Basically, Chicago is expected to do everything that Windows 3.1 does at least as well as 3.1 does it, doing most of what Windows NT does, with resource requirements no greater than those of Windows 3.1, while adding a completely new user interface and many other goodies. If that scenario sounds too good to be true, it's because it almost certainly is.

Chicago not only has to meet these goals (and more) to succeed, but it has to do so while maintaining virtually 100 percent compatibility with everything anybody is running with Windows 3.1 or 3.11. Anything less will mean that the upgrade to Chicago won't be a painless transition at all but, instead, one that requires a lot of thought, a lot of planning, and a lot of expense for users. That would open a veritable Pandora's box of horrors for Microsoft, because it would mean a slow transition and a prolonged period of overlap in which Microsoft would need to sell and support both Windows 3.x and Chicago.

Microsoft wants (and needs) to lead users to Chicago the way one leads a horse into a barn—just grab the reins and walk forward before any question can come up in the horse's mind as to where it is supposed to go. Anything else would

give the horse the option to ponder alternatives. Microsoft has a very difficult transition on its hands—even if it had no competition whatsoever. Toss in tough competition from OS/2 3.0 and Microsoft's problems get worse—much worse.

The scenario in which Microsoft loses entirely by failing to deliver Chicago in a form that is at all close to what was promised isn't the most likely. Chicago won't live up to the expectations created for it and is already taking much longer to arrive than it was supposed to take. The most likely scenario for an OS/2 victory, however, isn't one in which Chicago totally flops. It's more likely that Chicago will get there—eventually—but when it arrives it won't be nearly as good as OS/2. Chicago may not be a complete dud, but may be only a limited success. Limited success for Chicago would almost certainly mean defeat for Microsoft and for "Windows Everywhere" and a victory for OS/2 and IBM.

Once the widespread assumption of Microsoft's guaranteed dominance in operating systems is seriously put into question, customers will start to think about where to go next for operating systems. OS/2's installed base will grow more rapidly than ever before, and Microsoft's virtual lock on the hearts and minds of the majority of software vendors will come undone. Windows will no longer be the safe, sure alternative for anyone—customers, software vendors, system vendors, system integrators, or anyone else.

Unrealistic expectations

OS/2 3.0 delivers as much or more than Chicago promises. The momentum factor, which has been Microsoft's greatest advantage in the OS Wars so far, will not outlast a late delivery of a Chicago that fails to live up to the expectations Microsoft has created for it.

Disappointed expectations, however, are a dead certainty at this point. Chicago is already late, getting later and cannot possibly live up to Microsoft's "promise 'em anything" approach.

The simple fact is that, when Chicago finally does ship, customers will expect it to stand up to close scrutiny. Even the most elementary of the mainstream computer magazines will have to conduct a direct comparison with OS/2 3.0 on "meat and potatoes" measures, such as system performance on comparable hardware configurations, compatibility with existing 16-bit DOS and Windows applications, ease of installation and use, stability, and so on.

Don't get me wrong, I'm not ready (not yet anyway) to predict assured victory for OS/2. OS/2 still has a long way to go. Microsoft is a tough and resourceful competitor and has the substantial advantage of occupying much more desktop real estate with Windows than IBM does with OS/2. Even if Microsoft is able to deliver Chicago more or less as promised by mid-1995, OS/2 stands a very good chance of making major gains against "Windows Everywhere" in the year ahead. If Microsoft delays (or stumbles) further, however, and IBM presses its advantage, OS/2 has a very good chance of taking the lead by early 1996. It's no sure thing, but it is much more likely than most folks, even most fans of OS/2, think it is. If I were Bill Gates, I'd convert as much of my megabucks in MSFT stock to cash. Wouldn't you?

Will Zachmann, a well-known computer-industry analyst, is the founder and president of Canopus Research, based in Duxbury, Mass. He is also a former vice-president for corporate research of International Data Corp. You can reach him on CompuServe at 76004,3657, or on his popular CANOPUS forum.

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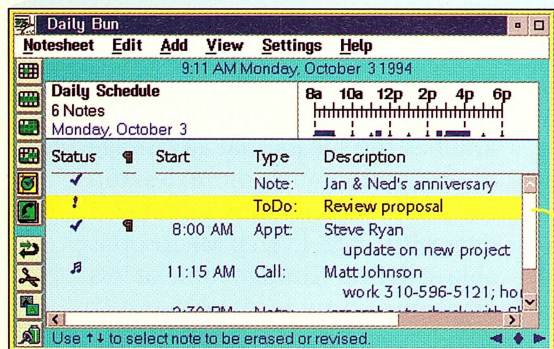
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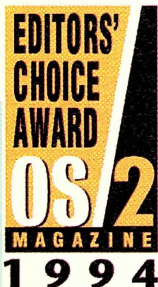
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Captured Viruses

BITWARE'S GALLERIA 2.1 AND IBM'S ANTIVIRUS/2 BY BRIAN PROFFIT



Galleria 2.1

When systems with VGA resolution or better became the norm it inevitably followed that people would begin gathering and using high-quality images in their computing. Dressing up reports and presentations and even including pictures of people in personnel databases became possible. Besides, we all enjoy looking at a nice picture. And, after spending the money for higher resolution and more colors, a beautiful background bitmap is a tangible benefit. Galleria is not a complete image-editing program, but it and its companion screen-capture program, Galleria/CM, make it easy to view and perform some image editing, convert images between several popular formats, and create new pictures of your own.

Support for a wide range of formats

Galleria reads and writes all of the common graphics file formats, including PCX, TIFF, JPEG, GIF, Microsoft's Windows BMP and Windows Metafile, WordPerfect's WPG, and Targa file formats. PhotoCD, GEM, Encapsulated PostScript, Amiga Interchange Format, MacPaint, GEM IMG, and Microsoft Paint formats are readable but not writable. Images can be read from files or copied from the clipboard. In fact, you can merge images from the clipboard with existing images to create new collage effects. When I was reading images from a file, I appreciated the

After spending the money for higher resolution and more colors, a beautiful background bitmap is a tangible benefit.

fact that BitWare went to the trouble to include a Find entry in the menu to save me the trouble of having to go to the Productivity folder for the Seek and Scan Files program. You can also drag and drop images onto Galleria.

Images can be rotated, cropped, or resized. And, you can adjust brightness and contrast, as well as color balance. I enjoyed the ability to use the right mouse button to bring up a quick menu of editing functions, as well as entries on the menu bar. Multiple levels of undo and redo allow you to back out of changes that don't qualify as improvements. In addition to the overall color balance, you can modify specific colors in the palette for more precise fine tuning.

Unfortunately, you can't do the detailed picture-editing work that more advanced packages allow. No drawing or painting functions are included. When you edit the

palette, you can't move the pointer to a specific area in the image and make it the current color in the palette editor. If you're working with an image that has many similar tones, such as flesh shadings in a portrait, it can be hard to locate the specific entry to change.

You can open a number of files or turn a list of files into a saved slide show. You can page through a series of images very quickly, because Galleria uses OS/2's multithreading ability to automatically read the next image from the disk before you request it. Galleria can automatically scale images to best fit the window size or sets the window size to fit the image. Either way, you don't have to worry about zooming or shifting scroll bars to position each image.

The image-print function is really nice, including support for color printers. During printing, images can be automatically expanded or reduced to fit the page size. In addition, the pre-processing filter does an excellent job of half-toning to provide quality output.

Capturing your own images

Galleria doesn't support scanners as input devices, so you need to use another method to create your own images. One option is BitWare's companion program, Galleria/CM, which captures images from your computer screen. It can include the entire desktop—all windows associated with a particular application—or only the window that is active at

the time of the capture. You can also specify rectangular regions of the screen to capture. These captured images can be sent to Galleria through the system clipboard or directly through DDE. They can also be saved directly as a file or sent immediately to the printer.

One slight quirk is that you can only capture the mouse pointer under certain circumstances. I'd like the option of including the pointer in the image, even if I'm not capturing the entire desktop. And, if I'm saving a specific application, I'd like to be able to capture only that application's window(s). Galleria/CM only includes the windows in the image, but the image size is the full desktop. The surrounding area gets painted with the background color, covering any other objects that are on the desktop. Sure, I can crop it, but why should I have to?

Glee or flee

If you have many images that you want to view easily, Galleria does a great job. You can quickly display them and make some changes. I would, however, like to see BitWare expand this product to allow drawing and painting functions with color pick-up (the eye-dropper tool!) to make it a more complete image system. It would be fine to include them in a Deluxe version, but the function should be made available. Still, for many people, Galleria may be enough. Galleria/CM does a straightforward job of capturing screen images and accurately saves them in a number of formats at top screen resolutions. Between the two packages, Bitware has provided a good mid-range imaging system that provides more function than the shareware offerings.

IBM AntiVirus/2

All computer users should realize by now that computer viruses are a serious concern. You run the risk of

**DOS programs
(including Windows
programs, of course)
are the primary portal
through which nasty
viruses can get to our
OS/2 systems.**

infection every time you download a file from another computer or put a floppy disk that you didn't create into your drive. Many of us continue to lament the fact that not enough OS/2 applications are available to eliminate the use of DOS and Windows programs. One major reason to look forward to removing DOS emulation from our systems is that DOS programs (including Windows programs, of course) are the primary portal through which nasty viruses can get to our OS/2 systems. At least we have OS/2 software with which to protect ourselves.

Hands-off operation

By default, IBM's AntiVirus/2 is configured to automatically start a complete scan every time you boot the system. That might sound great, because it takes place in the background and shouldn't noticeably delay the boot process. In practice, however, I had occasional timing problems. AntiVirus/2 apparently locked out some files that I needed to start the programs in my Startup folder (notably *command.com*). I found this fact surprising, because the program is supposed to delay about five minutes before starting its scan. This delay was erratic and problematic.

This problem is easily resolved,

though, by selecting the option to perform the scan at a certain time every day. By setting it for 10 a.m., the system still performed a complete scan every day and startup proceeded normally. If you're less concerned about infection, you can also instruct AntiVirus/2 to perform a scan weekly, or even monthly. Remember, though, that one of the reasons you bought OS/2 was so that programs like this could run in the background without bothering your regular work. The tiny resource cost of a daily scan seems like a good insurance investment.

If you're extremely resource-conscious and are already using a program that can start other programs at a specific time each day (such as personal information manager), you may want to let that program start the command-line version of AntiVirus/2 and avoid the constant overhead of the AntiVirus/2 timer program loaded from your *startup.cmd*. The standalone program can be extensively customized through command-line switches, so you really aren't sacrificing anything.

AntiVirus/2 scanned 1,653 files on my 510MB drive's three partitions with extensions of *.exe*, *.com*, *.cmd*, *.bat*, *.ov?*, *.os2*, *.dos*, *.bin*, *.sys*, and *.prg* in six-and-a-half minutes on a 16MB 66MHz 486. Of course, that was the first time during which AntiVirus/2 created its initial database of my files with their dates and sizes. Subsequent runs took less time—usually around two-and-a-half minutes, depending on how much my system had changed since the last scan. (If you are totally paranoid, you can disable the database-checking feature and force a re-scan of all files, whether they have changed since the last scan or not.) These time estimates would naturally be much longer if you disabled the Program Files Only setting and forced a scan of all files on the disk (a good idea if a virus has been detected). Again,

though, because this program runs peacefully in the background, the execution time really isn't an issue.

Continuous monitoring of DOS sessions

AutoVirus/2's Shield DOS module does an initial memory sweep when a DOS session is opened and optionally runs as a TSR to monitor for virus-type activity in DOS and Win-OS/2 sessions. That procedure does take some overhead, but you may consider it worthwhile for more security. This monitor isn't active in OS/2 sessions, but essentially all of today's viruses are DOS-based.

AntiVirus/2 has another feature that can lurk in your system and detect any access to the disk drive. When it sees an access, it automatically scans the disk's boot record for viruses. (For a brief introduction to the boot record's loader program, see "Perspectives," Nov. 1994, p. 7.) You can also instruct AntiVirus/2 to scan the boot record of any disk in the drive when a Shutdown is requested. The Shutdown scan may not sound like much of a feature until you think about the fact that a disk left in the drive is likely to take control of your system the next time you boot, before AntiVirus/2 has had a chance to become active.

Be aware, though, that these features are activated by being part of your *autoexec.bat*. If you have the DOS settings for a session configured to start a different batch file or you are running a session from a DOS boot disk, those sessions won't be protected unless you add AntiVirus/2's DOS Shield instructions to the batch files that are appropriate for those sessions.

By the way, if you are using Dual Boot or Boot Manager, you should install a copy of AntiVirus/DOS as well to protect you when you're running in that mode.

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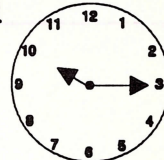
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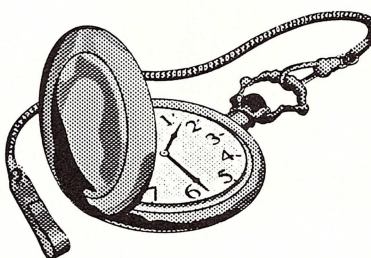
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Reader Service No. 12

programs work predominantly by looking for a certain series of characters (called the "signature") in a file that are common to that virus. But a programmer can easily develop a very minor mutation of the program that does the same thing, but that doesn't display the same signature. Good virus-detection programs need to be able to find these mutations by searching for programs that contain sequences that are almost, but not quite, the same as the known signature.

The problem is that the fuzzier the search, the more likely it is that the program will declare a "false positive," warning of a virus that isn't really present. IBM has good false-alarm intelligence built into AntiVirus/2. It successfully passed a file that Central Point Anti-Virus had incorrectly reported as being infected. And, AntiVirus/2 doesn't bother to report changes to program files unless they appear representative of a virus, unlike Central Point's product, which sounds an annoying alarm and requires manual intervention for each changed program file.

IBM carries this feature a step further with an intelligent analysis of changes that are made to files. AntiVirus/2 studies the change to see if it appears similar to the sorts of changes that take place with known viruses.

Applying antibiotics

AntiVirus/2 includes the ability to cure your system of many viral infections. When a virus is detected, you are given an infection report, including information on whether AntiVirus/2 can completely remove the infection, and recommendations for proceeding. IBM is confident that most common viruses can be completely removed this way. Still, call me overly cautious, but if you know you have been infected, I think you are better off reformatting your disk from clean disks and reloading from a clean backup, if possible.

Remember, regular backups are one of your best weapons against infection. Be sure to keep more than one generation of backup, because you may not discover that you are infected until you've backed up the virus at least once.

Other points to note

It is very difficult for any virus-detection program to scan compressed files. Unfortunately, that's how most viruses are transferred—via ZIPped or ARCed files downloaded from another computer. You should decompress those programs before scanning them for viruses. Hard disks that are compressed with programs like Stacker or the Data Compression Facility/2 (DCF/2), however, can still be scanned, because the compression program automatically expands the file before passing it to AntiVirus/2.

I appreciate IBM's enthusiasm in helping to ensure that your system is as well-protected as possible, but their inclusion of a "time out" message feels more like a marketing gimmick. Seven months after the release date of a given version of AntiVirus/2 (which may be only a few weeks after you actually purchased it), it gives you a warning that it has timed out and that you should buy an update. Yes, I realize that new viruses are being created constantly, but I notice that Central Point Software handles the problem by posting updates to their virus signature files on CompuServe for all registered users to download—a gentler and less mercenary approach. IBM charges \$29.95 for quarterly updates or \$89.95 annually.

Glee or flee

AntiVirus/2 was developed at IBM's Watson Research Center in Yorktown. Therefore, it didn't get the benefit of the user-interface experience shown in other IBM products, such as DisplayWrite and Communications Manager/2. It's

largely a port of a DOS program, although some reasonable graphical controls have been added. For a utility program like this, though, the clunkiness of the user interface doesn't matter, because once it is set up, the operation takes place totally in the background.

What matters is the strength of the scanning engine, and that is where AntiVirus/2 excels. The combination of the hundreds of known signatures plus the intelligent mutation and pattern detection make this a top-quality product. And, the superior false-alarm elimination routines make AntiVirus/2 more usable than the prettier, but more annoying, competition from Central Point Software.

Brian Proffit has been in the computing industry for 20 years. He was part of IBM's OS/2 team, left IBM to become the director of PC Week's Corporate Labs, and is now the president of Visionary Research. Brian is the author of two books on OS/2, is a contributing editor for OS/2 Developer and OS/2 Magazine. He can be reached on CompuServe at 75300,1466, or Internet 75300.1466@compuserve.com.

RESOURCES:

AntiVirus/2 (\$59.95)

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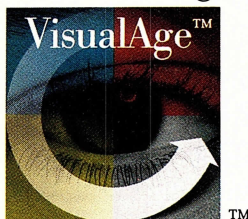
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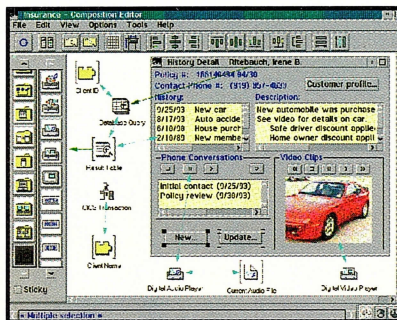
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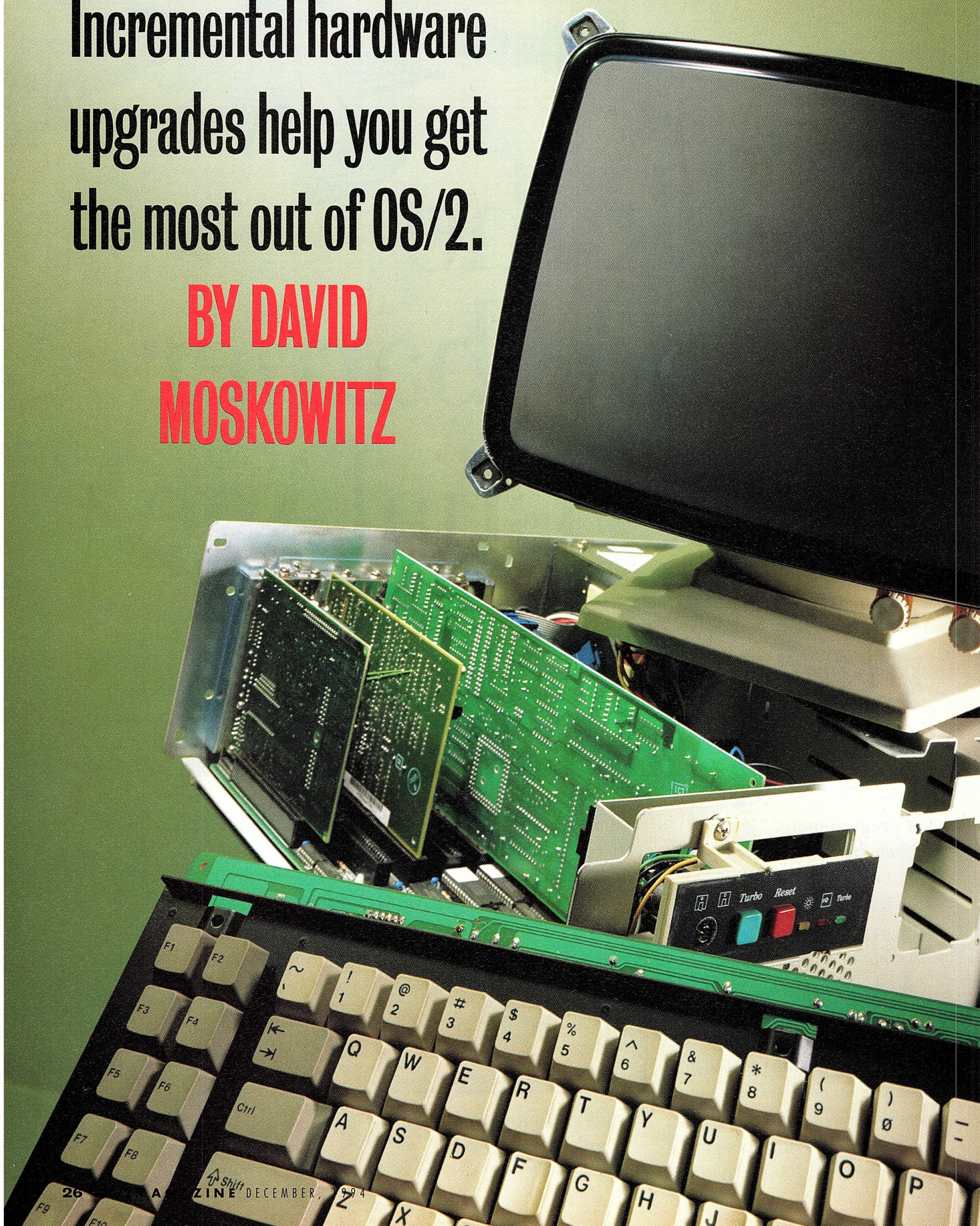
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Faster, Better, Neater

“What do you mean it’s obsolete, I just bought the thing last month!” Sound familiar? With personal computers, it’s true: Six months ago you could buy a mail-order 386-based system; today it’s almost impossible. A year ago, finding a Pentium system for an affordable price was a challenge. Today, you can get a Pentium PC for under \$3,000. As it turns out, that’s about what I paid for a 33MHz 486DX system with 16MB RAM, a 340MB hard disk, SVGA, and a 15-inch monitor just two years ago.

An axiom in this industry says, “If it’s fast in the store, in six months it will be slow. If it’s slow in the store, in six months it will be interminably slow—and the speed doesn’t change.” And who is satisfied with a slow computer?

Generation changes.

There are two solutions to the too-slow-PC dilemma: Buy a faster new system or upgrade the slowest parts of your existing system. If you purchased a computer more than six months ago, at least one component of your system is probably a "previous" generation part. As long as you're not upgrading too many components, you can upgrade these older components to get additional power without the expense of a new system.

You must have some idea what you expect from the upgrade. Do you want to turn your three-year-old PC into today's super-speedo-wonder? If so, you are going to be disappointed.

We've discovered that upgrading will improve system performance and extend the useful life of the system. Upgrades may even give you more capability, by allow-

ing you to install and use software you simply couldn't before. However, spending \$700 on new parts won't guarantee your system will win the next benchmark speed test.

Before you consider upgrading your system, you have to set some realistic goals for performance. You should also establish a budget. Don't plan on spending more than about one-third to one-half the cost of a new system. Since you can buy a fairly decent PC for between \$1,500 and \$2,500, that puts the upper price limit to between \$750 and \$1,250. Sure, you can spend more, but the results won't be as satisfying as the purchase of a new computer.

We've found that you can get significant improvements with an investment of \$700 or less. In some cases, an investment under \$200 can produce dramatic results.

Where to start

The most frequent upgrade is memory. Even if you're using the new OS/2, here's the rule: If you have less than 8MB RAM, add more memory.

What you get by adding memory to an OS/2 system is performance, not capability. OS/2 is a virtual memory system, which means that it can use more RAM than is physically installed in the computer. OS/2 achieves this goal by using the hard disk as a backing store for memory that is in use and doesn't currently fit within the limits of the installed RAM.

If you already have 8MB RAM, you will still see an improvement in performance if you add more. Why?

Assume, for a moment, that you have the world's fastest hard disk with an access time (the speed at which it can locate and deliver

Shopping for Memory

The general rule for any upgrade is to shop for a balance of service, support, and price. We visited some national chain superstores (CompUSA, Micro Center, and Computer City) and some regional stores (Fry's in California). For some things, Fry's had a better price than the national chains (disk drives and memory). For other items (hard disks, graphics cards, and mother boards) we found the best price in a small local store.

RAM has the most volatile prices, so you have to shop around. Here are some rules to consider to help you find the best deals:

- Ask people you trust where to get good memory prices.
- Plan to make a few phone calls to find an acceptable price. Don't accept the first offer. Also, don't take too long to shop, prices change (for memory, prices change weekly; other components, such as hard disks, have prices that can last a month or so). It's always a good idea to ask how long they will guarantee the quoted price.
- Make sure they have the right type of memory chips. You may have to pop-the-top on your system to determine the physical chip style (SIPs, SIMMs, and so on), and speed (70ns or 80ns). If you don't know or don't feel comfortable doing this, ask a trusted friend or technician. If you have a name-brand computer, a computer store can check for you without looking at your PC. If you have a generic clone, you'll need to take a look.
- Purchase chips that match the speed of the ones already in the computer. OS/2 doesn't work well if your RAM is made up of chips with different speeds. If you have older 80ns chips, you may have to replace

them with newer 70ns before you add additional memory, since those 80ns chips are difficult to find.

- If your motherboard (the PC's main circuit board) supports both 30-pin and 72-pin SIMMs, it may be worth the extra money to get today's standard 72-pin configuration, since the 72-pin chips will be portable to new systems. Otherwise, get the chips that match your motherboard configuration.

If you plan to bring your PC's RAM to more than 16MB, make sure you have a motherboard that supports more than 24 address lines. If it doesn't, you won't be able to access the additional memory. Check the owner's manual or call the manufacturer to find out.

Similarly, make sure you don't have a caching controller that uses the space above 16MB, since this will also make it difficult for OS/2 to access the additional memory. Check the manual if you're not sure. Note: OS/2 will handle the additional memory automatically, provided the hardware doesn't get in the way.

What should you expect to pay for RAM? In mid-July 1994, we found prices ranging from \$32 per MB for 30-pin SIMMs to \$50 per MB for 72-pin SIMMs. We also found that many people have a favorite source for cheap memory, so ask around, call dealers, and get the best price. Make sure you can return the chips for a full refund if they don't work or fit in your system.

Mail-order is another avenue; the best mail-order ads can be found in computer publications such as *Computer Shopper* and *PC Magazine*. Also, you should check your local OS/2 or PC user groups and flea markets for information and to compare prices.

information) of one millisecond (one-thousandth of a second). That's a snail's pace compared to your PC's RAM, which is probably rated at a delivery speed of 70 nanoseconds (70 billionths of a second). That is a difference of five orders of magnitude. RAM is approximately 100,000 times faster than our idealized hard disk. So, using any hard disk in place of RAM is slow, slow, slow.

Upgrading the hard disk

You have two choices if you want to upgrade your hard-disk capacity. You can replace the existing disk or add a second drive to your present setup.

The choice depends upon the type of drive and controller you already have, your power supply, the number (and size) of available bays in your case, and whether you

Still life in an AT

It looks like an original IBM-PC AT complete with the IBM logo, and it runs OS/2 for Windows! Didn't IBM use a 6MHz Intel 80286? Doesn't OS/2 2.x require at least a 386SX?

Of course, an IBM-PC AT isn't capable of running OS/2 2.x. However, about three years ago, we replaced the original 286 with a Kingston 386SX Now! purchased from Sigma Data for \$295. The instructions could have been clearer, the chips labeled a little better, but it worked.

Long before that time, the original CMI 20MB hard disk joined its peers in the reef. It was replaced by a Seagate 80MB drive (Trenton Computer Festival Flea Market, \$75). At the time, Clyde Washburn offered the Second Nature ROMs (\$50) that allowed us to use hard disks that weren't allowed by IBM's original BIOS. The 386SX Now! included a BIOS replacement with an entry for the Seagate drive. We've also added 7MB RAM (for a total of 8MB) over time at varying prices, some of it in single 256KB chips.

When the hard disk crashed, we made a late-night dash to the local CompUSA where we purchased a Maxtor 320MB drive (\$260 including \$20 for an IDE controller that also supplies two serial ports and a parallel port). If we had more time, we could have purchased the drive and controller via mail-order for about \$40 less.

We restored the tape backups and were back in business with minimal losses (one of these days we'll get a new tape drive, since our Maynstream 60 is getting a bit old, but it still works).

The total price for upgrades over the eight years we've owned the system was about \$700. As a result, we've extended the life of the AT to a system that can run OS/2, is reasonable for word processing, and not bad for communications. It's not nearly as fast as today's systems, but it's a fine secondary OS/2 PC.

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want to change the type of hard disk (for example, moving from IDE to SCSI).

Most of the systems sold in the last couple of years included an Integrated Device Electronics (IDE) controller built into the motherboard. Most IDE controllers can handle two hard drives. IDE controllers are usually limited to controlling hard disks.

If you have a SCSI drive and adapter, you can connect as many as seven devices (14 if you have a double-channel adapter). SCSI adapters also allow you to connect scanners, removable hard disks, and CD-ROM drives to the same adapter. If you're thinking about a SCSI drive, make sure you know the type of SCSI adapter you have. Different types provide varying per-

formance characteristics and compatibility issues. The original SCSI devices transferred about 5Mb (megabits) per second. The newer SCSI-2 devices are much faster, offering transfer speeds up to a maximum of 40Mb per second.

SCSI-2 comes in three flavors, Fast, Wide, and Fast-Wide. Fast SCSI-2 transfers data at 10Mb per second; fast adapters are either 8- or 16-bit. Wide SCSI transfers data at the same rate as Fast, and its adapters are either 16- or 32-bit. Fast-Wide SCSI zips along at about 40Mb per second and its adapters are designed for a 32-bit bus (EISA, Micro-channel, PCI, or VESA). Few Wide or Fast-Wide SCSI hard drives are currently available.

As mentioned earlier, the older 8- or 16-bit IDE adapters transfer data at 5Mb per second. The newer

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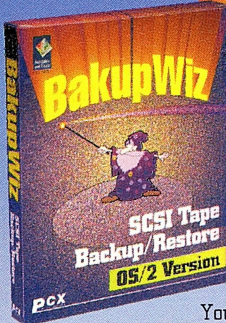
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Swapping a motherboard

An associate wanted to upgrade his graphics board and we talked him into allowing us to plan a slightly larger upgrade. He was prepared to spend \$250 on an ISA graphics accelerator. We asked him to let us try to upgrade his system for less and still provide the same performance. He agreed.

We spent \$105 on a new bare-bones VLB motherboard that accepted both 30- and 72-pin SIMMs (his old motherboard was worth about \$25 in trade) and \$79 on an SVGA local-bus graphics board. The service cost to move the chips from his old motherboard to the new one and test the system was \$49.

He reported an immediate improvement in system performance. So much so that he spent an additional \$350 on 8MB RAM (which he added himself).

Overall, he says system throughput is three times faster than the original system, and at a cost of less than \$583 in hardware and services. He hopes the new system will last about a year before he feels the need to do anything else. Finally, he's waiting for a retail version of OS/2 SMP to be carried by his local dealer. When it is available, he plans to add another processor to his new motherboard and run the SMP software.

32-bit bus adapters run eight to 10Mb per second, provided the drive can deliver data that fast. IDE drives can be competitive in price and performance with SCSI.

With IDE or SCSI, you have to match drive and adapter characteristics for optimal performance. It doesn't make any difference if you have the world's fastest drive if the adapter isn't capable of delivering data at a comparable speed.

Changing disk-controller cards doesn't always produce the expected performance increase unless you're adding a caching disk controller. For example, if you change from either a motherboard or an ISA bus disk controller to VESA or PCI disk controller, the results might prove disappointing. Recognize that most of the improved performance comes from the cache and not from a bus change.

The one nice thing about adding (or upgrading) a hard disk in an OS/2 system is that you don't need to fool around with device drivers to access the entire hard disk. FAT is limited to 1,023 cylinders, HPFS isn't. Put HPFS volumes at the end of the hard disk and toss the DOS device's drives into your nearest disk recycle bin.

(Here's another thing to consider for your OS/2 system: See if your drive and adapter combination support multiple mode. Modify the:

```
basedev=ibm1s506.add
```

line in your *config.sys* to:

```
basedev=ibm1sd506.add /u:0 /sms /v.
```

These parameters improve performance on drives that support it and are usually ignored if the drive

doesn't—it works even if you don't upgrade.)

Disk drive alternatives

Before you buy a second hard disk, consider disk-compression software from Stac Electronics (Stacker for OS/2 and DOS) if you have FAT volumes, and DCF/2 from Proportional Software if you have HPFS volumes.

Compression software will increase the amount of apparent disk space. Depending upon the information you preserve on your hard disk, you could be able to store between 1.5 times and twice as much data within the same physical space.

However, a trade-off must be considered. It takes time to compress and restore the files using the software. While both Stac Electronics and Proportional Software have taken great pains to minimize

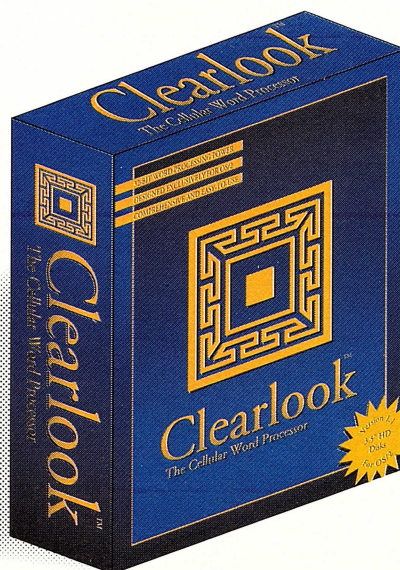
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the impact, it can be noticeable (even more so if you have enabled OS/2's undelete mechanism). The advantage: you delay the purchase of another hard disk. You have to determine if the performance penalty justifies the wait. The disk-compression software also consumes some amount of RAM for caching, so if you have very little RAM, compression might not work for you.

Selecting the hard disk

Make sure you get one that's large enough. A maxim in the industry states, "No matter how much hard disk space you have, it is never

enough." Hard disks used to cost about one dollar per megabyte. In our research we found we could get a hard disk priced at anywhere from 57 cents per MB for a 420MB disk (\$239) to 86 cents per MB for a 250MB disk (\$215). Check prices, the best value may not be in the largest drive.

If you have an IDE disk, the second hard disk needs to be compatible with the first. Multiple IDE disks on the same controller operate in a master-slave relationship. You have to be sure the "language" used by the master (the first disk) is understood by the slave. If it isn't, the second disk won't work. The best tac-

tic is to buy your second disk from the same manufacturer as your first disk.

Oddly enough, we found that it is easier and cheaper to upgrade disk drives on SCSI and clone systems than to upgrade major name-brand IDE-based PCs. Why? The clone makers tend to use common off-the-shelf components; the major brands often make their own disks or buy them from an obscure source that's hard to identify.

When you go to your local computer store, talk to the technicians to ensure that you're buying the right disk. Many variables relating to your PC will affect your choice.

Drop-In turbocharger

While talking to David Moskowitz about writing this system-upgrade article, I recalled that Cyrix Corp. (Richardson, Tex., [214] 994-8388) manufactures a 486 upgrade chip that drops into a 386 socket—and the Cx486DRx2's packaging explicitly mentions OS/2. So, we had to check it out.

The Cx486 upgrade line include six chips: two that upgrade 386SX systems (20 and 25MHz), and four that upgrade 386DX systems (16, 20, 25, and 33MHz). These upgrade CPUs are all clock-doubled 486 clones, like Intel's 486SX2 and 486DX2, which means that the new 486 chip runs internally at twice the speed of the original 386. For example, the CPU we tested, the Cx486DRx2-33/66 is a 66MHz 486DX that drops into a 33MHz 386DX motherboard. (This chip is roughly analogous to Intel's 486DX2-66.) The new CPU also includes 1K of onboard cache, which is controlled by software included for OS/2, DOS, and Windows. Kudos to Cyrix for putting the OS/2 cache software right in the box.

This Cyrix upgrade processor does *not* include a math coprocessor. If the 386 system already had a 387 installed, the new Cx486DRx2 will use it. If no math coprocessor was installed, the upgraded system still won't have a math chip.

The test system was a generic 33MHz 386DX system that was purchased back in 1992 at Fry's Electronics. The system has an April, 1990 American Megatrends Inc. (AMI) BIOS, 8MB RAM, and a 387 math coprocessor. We chose this system for testing because according to our reader surveys, quite a few *OS/2 Magazine* readers are using similar 386DX systems to run OS/2.

The installation was very fast—under 10 minutes—with the single largest amount of time spent dismantling and removing the system's drive bays to free the hidden 386DX. The old 386DX pulled out easily using the chip-removal tools included with the Cyrix upgrade and the new Cx486 popped right in. The new chip also came with a heat-sink, which Cyrix recommends be installed, and we did so.

The computer booted right up, once we had pushed the new Cx486 firm-

ly into the socket. Everything worked: OS/2 for Windows booted right away, and so did DOS under dual-boot circumstances. Windows 3.1 also ran right away. We tested the Cx486 with a variety of OS/2, Windows, and DOS applications, and encountered no problems. The only glitch was Norton SysInfo 6.0 for DOS, which hung during the memory test. However, I've known SysInfo's memory test to hang on other systems as well.

Now, for the 64K question: Is it faster? In a word, yes. We ran a variety of common benchmarks for DOS, Windows, and OS/2, and all CPU-specific measurements recognized the 486. Without the 1K cache enabled, speed improvements of between 34.1% and 47.9% were shown. After enabling the Cx486's onboard cache, those same benchmarks showed improvements of between 70% and 129.4%. Of course, non-CPU-specific performance, such as hard-disk speed, video-board performance, and telecommunications were not affected in direct testing.

I performed similar tests on a Compaq 486DX2 machine running at 66MHz. No surprise: The "real" 66MHz 486 computer, with local-bus, 486 BIOS, and other modern components, outperformed the souped-up PC. Results ranged from about 80% faster than the Cyrix-upgraded machine, to about 140% faster. In other words, the Cyrix upgrade bridged nearly half the performance gap between an old 33MHz 386 and a new 66MHz 486, for less than the price of a new good-quality 486 motherboard and CPU.

My one concern with the Cx486DRx2 is heat. After about 10 minutes of operation, the Cx486's heat-sink was too hot to touch for more than a few seconds. However, since the 33MHz version of the Cx486DRx2 is likely to have the greatest heat problems, and we've been running it for more than two weeks without a failure, we can't conclude that a problem exists.

Overall, we're impressed with the Cx486DRx2. If your entire PC system is working just fine, and your only bottleneck is CPU speed, this upgrade is very cost-effective. Just keep in mind that you're *only* upgrading your CPU; the rest of the system, from hard disk to graphics, to bus to serial ports, will be unchanged—*Alan Zeichick*.

Make sure you can get a full refund if the disk doesn't work in your system and ask for the refund policy in writing (always a good idea). Sometimes, it is easier to get the guarantee if you pay them to install and test the disk.

Motherboard upgrades

If you have a clone system and want to improve performance, consider replacing your motherboard. You can move from a board with ISA slots to one that also has VESA local bus (VLB). This way, you will be buying a longer-term upgrade than if you were to upgrade your graphics board by itself (more about that subject later).

You have two choices if you decide to change your motherboard. You can buy a "bare board" and fill it up with chips yourself, or you can buy a board with at least a CPU processor. Bare boards are cheaper and useful if you want an Intel over-

drive socket or local-bus graphics. Some of the newer motherboards support simple symmetric multiprocessing (SMP) if you add an overdrive processor, in which case, the Intel overdrive processor doesn't cut out the original processor.

Bare boards cost from \$75 to \$250 (a 386SX at the low end to a Pentium at the upper end). For a board with a processor installed, you could spend from \$300 for a 25MHz 486 to \$1,700 for a 66MHz Pentium. Of course, the prices and specifications change constantly.

Make sure the BIOS and board support OS/2, and get a guarantee that you can return the board if you install it yourself and it doesn't work. The best bet, however (unless you're technically inclined), is to let their technician install the board in your system.

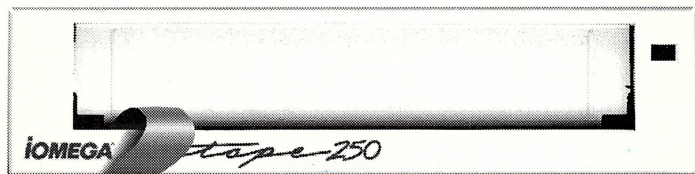
Graphics

One store salesperson told us,

"Change your graphics board to see immediate improvements." It is possible that adding more memory and a bigger faster hard disk may yield disappointing results. Why? Because your graphics board is acting as a bottleneck, and simply can't put stuff on the screen any faster.

This graphics bottleneck is most apparent with older ISA graphics systems. If you want graphics zip, be prepared to spend from \$150 to \$300. Some of the newer (and more expensive) graphics boards are designed for today's popular local-bus architecture, and aren't available for the older PCs based on the ISA, EISA, and IBM's Microchannel buses.

Before you spend money on a new graphics board, make sure your monitor can handle the card. It's worthwhile to spend some time asking questions. The last thing you want is to spend money on



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improved graphics performance only to discover that your monitor starts smoking because it can't handle the signals from the graphics board.

Seriously, make sure the monitor can handle the resolution of the adapter without flicker. If you can find a local source, ask them if you can bring your monitor in to test the configuration before you spend your money. Use their system, their graphics board, and your monitor. Make sure their technician verifies that your monitor can handle the signals from the adapter before the test. We found that a cheap local-bus adapter without an accelerator may provide the same level of performance as an accelerator in an ISA system (see our case study for more details.)

To get about a 40% improvement in graphics performance, consider swapping motherboards. For the price of an ISA accelerator you may be able to get a VLB motherboard and VLB graphics board. They will give you about the same performance level and, at the same time, provide an additional upgrade path to a faster graphics board later.

If you want to upgrade your monitor (usually an expensive proposition), check out your local computer store. For example, our local CompUSA has a monitor-wall composed of 16 monitors from different manufacturers, all driven from one computer. They told us they would be delighted to add our monitor to the collection to see how it measures up.

One other important point. While OS/2 supports a wide range of video adapters, it doesn't support them all. Don't buy the fastest, most spiffy video adapter only to discover you don't have (or can't get) OS/2 drivers. You can avoid frustration with a little fact checking. If it doesn't say OS/2 on the box, make sure you can return the adapter if you can't make it work.

Can I install it myself?

If you have to ask this question, you probably know the answer. If you're not confident in your computer-overhaul abilities, you should consider paying a technician to do the work for you. We found prices that range from a flat \$30 to install and verify that memory works to \$65 per hour for other projects.

Most of the shops we talked to provided a flat rate to do most fixed tasks. If the store says there is an hourly charge, find another place. Charges vary, so be sure to ask before you allow them to get started. Get quotes.

It is worth shopping around. One store in the Philadelphia area started a free upgrade policy for a month, if you bought the components from them. While their parts prices aren't the best, when you factor in the installation, it makes them better competitors.

Not afraid of a screwdriver, but looking for more in-depth information? The best book I've seen about PC hardware is *The Winn Rosch Hardware Bible, 3rd Edition* by Winn L. Rosch. This book is a techie-nerd's delight. Everything you could possibly want to know is in this book. It's easy reading, but the author assumes the reader isn't afraid of a screw driver.

Another book that covers the same material without the background assumptions of the Rosch book is *Upgrade and Maintain Your PC* by James Karney.

Foresight

Unless you have deep pockets, you won't have the fastest or best system for long. In six months, something faster or better will arrive on the market using the very latest technology. It's a never ending story. Until you're ready to jump to a new PC, incremental upgrading allows you to put off a major expense while providing an improvement in functionality.

It isn't a good idea to spend

money on an upgrade unless you can get at least a 40 to 50 percent improvement in performance or capacity. Anything that results in less probably isn't worth the price.

Don't assume your component dealer knows about OS/2. Some do, many don't. If OS/2 was running on your system before, but doesn't after the "upgrade," check to be sure your vendor gave you the necessary device drivers. If it still doesn't work, review some of the points we raised in this article. Is the memory the same speed? Is the new hard disk compatible? Does the motherboard's BIOS support OS/2? Upgrading works! The degree of success depends upon you and your system.

David Moskowitz is president of Productivity Solutions, a Norristown Pa.-based consulting firm that specializes in OS/2 and object-oriented development. He is a contributing editor to OS/2 Magazine and a featured author of OS/2 2.11 Unleashed, 2nd Edition. He can be reached via CompuServe at 76701,100 and via Internet as dmoskowitz@cis.compuserve.com.

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The DOS, Win-OS/2, and sound-card settings you'll need for best results.

BY ERIC PINNELL

If you take a look inside your local CompUSA, Egghead, or other favorite computer store, you'll see that the shelf space devoted to computer games is nearly as large as the space used for applications and utilities. OS/2 users, like all other computer owners, enjoy playing computer games.

In the past, many OS/2 users needed to boot from a DOS floppy to play their favorite games. And, in some cases, this procedure might still be necessary. However, especially since the release of OS/2 2.1 and OS/2 2.1 for Windows, OS/2's DOS and Windows support make it an especially attractive environment for running today's most popular computer games. The ability to assign individual settings to each application largely eliminates the need to boot into DOS, although we'll discuss some exceptions later.

However, because of the numerous "gotchas" that a user can experience when running games under OS/2, it's important for game players to understand the best DOS and Win-OS/2 settings for games, as well as tips for configuring sound cards. The sound-card data is a compilation of various files from the Internet, as well as some IBM technical support notes. The examples here are for an Audiovation sound card installed in an IBM PS/2 model 95, but should be typical of most sys-

Game-playing with OS/2

tem configurations.

Remember to check the *readme* file that comes with OS/2. It contains a listing of several programs and ways to set them up to run properly.

Due to OS/2's increased overhead, most computer games will run under OS/2's DOS and Windows emulation at 70 to 90% of the speed of native DOS. However, it's usually only with the processor-intensive applications, such as flight simulators, that you will notice a speed decrease, since many other types of games (such as adventure games) aren't pressing the processor's limits.

Some games will actually run faster under OS/2 than under DOS. This is often true of games that read and write from the hard disk frequently, due to OS/2's superior file input/output subsystem.

Game limitations

Because OS/2 is a protected-mode operating system, any product (such as Novalogic's *Comanche: Maximum Overkill*) that uses the VCPI DOS-extender technology will not run under OS/2. In fact, VCPI applications will not work with *any* real-mode memory manager (such as QEMM or 386MAX), so they require a DOS boot floppy. DOS extended 32-bit programs that support the DOS protected-mode interface (DPMI) memory management should work fine under OS/2. Note that earlier versions of the Phar Lap and Rational Systems DOS extenders do not work with OS/2. If you have doubts, check with your game manufacturer to see if they have an update or patch for OS/2 compatibility.

You may have problems with sound under OS/2. Because the OS/2 virtual DOS machine (VDM) can only



support a limited number of interrupts each second, the sound may not work properly on games that use high interrupt rates, sometimes

resulting in a sort of mooing or moaning sound coming out of your speakers. However, some programs that use the waveform-syn-

thesis ability on sound cards will produce sound effects normally under OS/2. Windows games that use sound should be supported if you have the Windows multimedia extensions installed.

Don't multitask processor-intensive games (such as flight simulators). Doing so can result in a game that performs poorly or pauses momentarily, which can be an immense distraction. For similar reasons, don't run games in a window—they'll perform much better in full-screen sessions.

Some games have trouble with introduction screens, which often show animated "movies" in great detail. If possible, disable the game's introductory movies. Also, try not to switch (<Alt+Esc>) away from a DOS game and back, since many DOS games will crash.

When in doubt, contact your game manufacturer to see if their application is OS/2-compatible. As IBM is in the process of greatly expanding the applications compatibility testing for OS/2, game vendors should be able to supply you with the particular settings for your game. In addition, use of on-line services such as CompuServe, America Online, and others can help put you in touch with other game players who have optimized the settings for a particular game.

General sound card rules

Please ensure that your sound card does *not* use interrupt 7, which is reserved for use by the LPT1 (printer) device. Try to use interrupt 5 instead. Also try to avoid using any interrupt above 9, because many DOS applications systems cannot access interrupts above 9. This restriction does not apply to OS/2 applications that can use high IRQ and DMA channels.

Similarly, make sure you have the most recent drivers for your sound card. On CompuServe, you can find a large number of drivers in Section 3 of the OS2USER forum

Installing the Sound Blaster 16 and ASP cards.

Sometimes when you install the SoundBlaster 16 and ASP cards under OS/2, they won't work properly. Here's a method that will install them correctly:

- 1) Install MMPM/2.
- 2) Reboot the System: on some systems, you may find that digital sounds will have the beginning of the sound cut off. Some short sounds won't play at all. The solution is to go into your *config.sys* and find the line that says:

```
device=d:\mmos2\sbd16d2.sys 1 1 5 5 220 8 /n:sbaud1$
```

Then, change the buffer parameter **8** to a **2**, so your new statement will be:

```
device=d:\mmos2\sbd16d2.sys 1 1 5 5 220 2 /n:sbaud1$
```

The correct format for the *sb16d2.sys* drive is not included in the OS/2 2.1 *readme* file. The following format is the one you need to use. If you only have one board, the board number will be set to **1**:

```
device=d:\mmos2\sbd16d2.sys board# 8-bitdma  
16-bitdma irq ioaddr bufsize
```

- 3) Go into the Win-OS/2 full-screen control panel, and remove all of the drivers except for the MIDI Mapper, Timer, [MCI] MIDI Sequencer, and [MCI] Sound.
- 4) Install the SB16 DOS software onto your hard drive. When the prompt comes up and asks you where your Windows directory is, be sure to type: **c:\os2\mdos\win-os/2** (or **d:** if your OS/2 boot partition is on *d:* drive).
- 5) Look at your *config.sys*. If you have an SB16ASP, find the line:

```
device=c:\sb16\drv\asp.sys /p:220
```

and remove the entire line. For SB16 cards, the driver is *csp.sys* and should also be removed. Then, in your Win-OS/2 sessions only, place the *asp.sys* and *csp.sys* driver statements into the **dos_device dos** setting. Make sure that you have the parameters exactly as they were in your *config.sys* statement. Regular DOS sessions do not need *asp.sys*, but Win-OS/2 sessions do.

- 6) Reboot your system.
- 7) Run Win-OS/2 full screen. The SB16 Windows Driver setup will run automatically, assuming that you correctly told the earlier driver to install where Win-OS/2 was. If not, from Win-OS/2 full screen, run **c:\sb16\winsetup.exe**.
- 8) Restart Win-OS/2 full screen. At this point, you may get a Winshield error because the Voyetra FM driver loaded earlier is very unfriendly to Win-OS/2. If the Winshield error occurs, press <Alt+Esc> to get back to the OS/2 desktop, and close the Win-OS/2 full-screen session. Repeat this step until the Win-OS/2 full-screen session comes up without the Winshield error.
- 9) Go into Control Panel (Drivers) and highlight the FM Voyetra Sound Blaster FM driver. Select Remove, then Yes, then Restart. You should no longer get the Winshield errors.
- 10) If you have a Waveblaster, all that is necessary is to go into the MIDI mapper and select SB16 Ext MIDI. If you don't have a Waveblaster, you must find a substitute FM Synthesis driver to replace the Voyetra driver. One source is the Creative Labs BBS (405-742-6660). Once you have obtained an updated driver, go into the Win-OS/2 full-screen session, Control Panel, Drivers, and select Add. Highlight the Unlisted or Updated Driver. Select OK. Type the drive and directory where you placed the driver. Highlight the Creative Labs Sound Blaster-MIDI Synthesizer and select OK. Select the appropriate address, then select Restart. Go to the Control Panel, MIDI Mapper, and select SB All FM.

and in section 17 of the OS2SUPP forum.

After you install MMPM/2 on your system, reboot the computer before editing any *config.sys* statements, make corrections, then reboot the system again. And, as always, back up your desktop, *config.sys*, and *autoexec.bat*, in case something goes wrong during driver installation.

Ensure that your sound card is of a version that is supported under OS/2. Certain models of early Sound Blaster and PAS cards cannot work with OS/2. You may be able to upgrade them to a more modern version for a nominal fee.

Do not run multiple game applications simultaneously under OS/2, since applications cannot share sound cards. If you are running more than one application, it is the first application that gets control of the sound card. Similarly, a DOS and Windows application cannot generally share the same sound card (although it is possible for cards with multiple chip sets such as the PAS16 to have one chip running DOS and the other running Windows). Table 1 lists a variety of drivers and patches for sound cards.

Audiovation adapters

IBM has recently released OS/2 drivers for the Audiovation sound card (version 20, dated 5/27/94). MMPM/2 support is provided, and works with OS/2 2.1 and OS/2 for Windows. Win-OS/2 support is provided *only* for OS/2 2.1 (it does not currently work for OS/2 for Windows). No DOS VDM support is available for game sound. However, because the Audiovation card contains a digital-signal processor (DSP), we hope to see support for OS/2 for Windows and DOS VDMs in the future (hopefully soon).

Pro audio spectrum cards

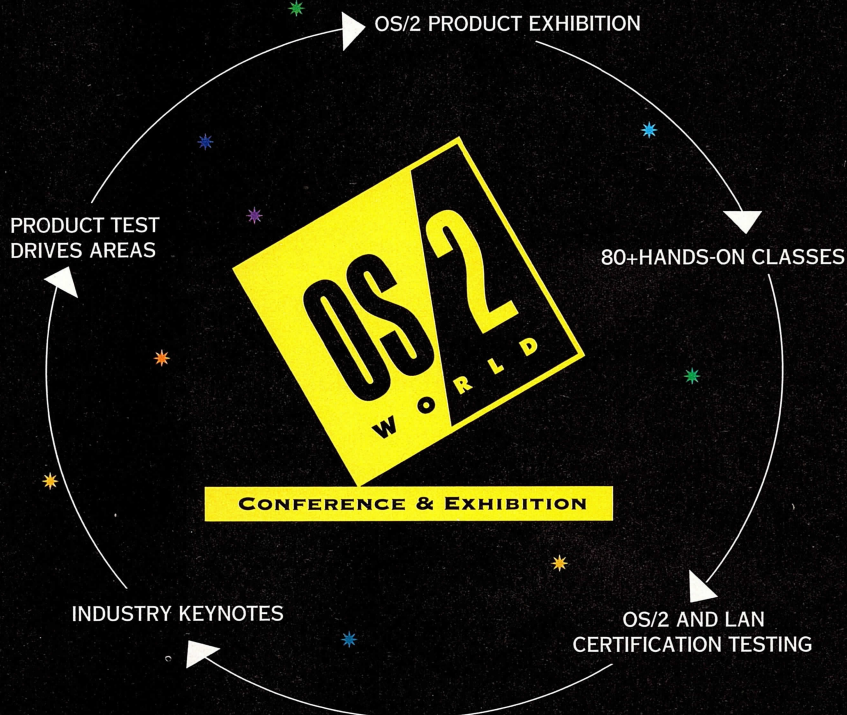
The older PAS16 card, with a model number of 650-0082-03, is not sup-

Table 1: Sound-card patch and driver files.

You can find these drivers and patches in CompuServe's OS/2 forums, and other electronic sources.

FILE	SIZE	LOCATION	DESCRIPTION
SB_OS2.ZIP	98,994	OS2USER Sec. 3	Sound Blaster drivers (28-2-94)
SB16DD.ZIP	21,005	OS2SUPP Sec. 17	Sound Blaster 16 bit drivers (3-4-94)
FMRST3.EXE	20,078	OS2USER Sec. 3	Patch to reset FM on Sound Blaster cards.
MDSOS2.ZIP	370,250	OS2USER Sec. 16	Modem DOOM patch (v 1.2). Shareware.
T7GFA3.ZIP	300,220	OS2USER Sec. 16	Patch for CD-ROM for The Seventh Guest.

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Table 2: Common DOS and Win-OS/2 parameters.

You'll find these general settings to be appropriate for nearly all DOS and Windows games.

PARAMETER	VALUE	WHY?
DOS_FULLSCREEN	ON	Most games run poorly in a window.
DOS_BACKGROUND_EXECUTION	OFF	So your program won't take CPU cycles while running in background, which will slow your system greatly.
DOS_HIGH	ON	Gives more memory to games that need it.
DOS_RMSIZE	640	Gives DOS applications 640K of memory.
DOS_UMB	OFF	Most DOS games do not want to use Upper Memory Blocks (UMB). Set to ON for games that do.
DPMI_MEMORY_LIMIT	0	Most DOS games do not use DPMI memory (but 32-bit DOS applications do). Increase if needed.
EMS_MEMORY_LIMIT	1024	Most DOS applications that access more than 640K use EMS memory.
HW_ROM_TO_RAM	ON	Copies ROM BIOS to RAM, which speeds up processing.
HW_NOSOUND	OFF	We definitely want to have sound effects under our games.
HW_TIMER	ON	Necessary for games that use timing loops. Setting to OFF can speed games that do not need the timer.
IDLE_SECONDS	10	Makes idle detection take a long time, so that overhead for idle detection is minimal.
IDLE_SENSITIVITY	100	If an application is idle, it is detected immediately.
KBD_ALTHOME_BYPASS	ON	Keep this OFF if you want to flip to a windowed session to check walkthroughs and so on.
VIDEO_FASTPASTE	ON	Improves cutting and pasting speed.
VIDEO_RETRACE_EMULATION	OFF	Leaving this ON can make some games run too fast, and others too slow.
VIDEO_ROM_EMULATION	OFF	Improves video performance.
XMS_MEMORY_LIMIT	64	Needed for DOS=HIGH

Table 3: Freeware OS/2 Games.

Quite a few freeware games are available for OS/2. Here's a list of what's currently available in CompuServe's OS2USER forum, section 16.

FILE	SIZE	DESCRIPTION
ASTER2.ZIP	27,447	Asteroids for OS/2.
BOMB.ZIP	7,936	Bomb Squad. Somewhat like Minesweeper.
CLICK.ZIP	32,943	Teaches children how to click the mouse.
CRAPS3.ZIP	50,332	32 bit OS/2 version of the craps dice game.
DALEKS.ZIP	83,968	Avoid-the-robots game.
DFA200.ZIP	61,440	Network game: You blast other players on network.
FOOTBA.ZIP	41,728	PM graphical version of class football game.
MAHJON.ZIP	89,088	Mahjong game.
MINE.ZIP	45,056	32 bit Minesweeper game.
MINE21.ZIP	745,200	Minesweeper game with MMPM/2 sound.
MONDAY.ZIP	11,749	Monday adventure game.
MORP52.ZIP	259,867	Port of Unix's Umoria dungeon game.
NH313.ZIP	719,428	Nethack 3.1.3 dungeon game.
NPM.ZIP	38,144	Newton PM planetary system simulator.
OS2BAT.ZIP	15,360	PM Battleship game.
PMCHES.ZIP	85,146	PM Chess version 1.01
PMHORO.ZIP	159,100	PM horoscope program.
PMMINE.ZIP	23,843	PM minesweeper game (game cannot finish).
PMTTT.ZIP	9,216	PM tic-tac-toe game.
REVERS.ZIP	12,380	Reversi v 1.0.
SIRTET.ZIP	35,584	OS/2 Tetris.
STONE.ZIP	24,847	Search for the Sacred Stone.
TAQUIN.ZIP	10,240	Jeu de Taquin 5x5 sliding puzzle game.

ported under OS/2 (0082 is the critical number). If you look at the chips on the card, the suspect chip has the ID MVA-508B.

When configuring a PAS card, you should consider using a high IRQ (10, 11, 12 or 15) and a high DMA channel (5 or 7) for the PAS side of the card. This way, you can run DOS games with Sound Blaster support and OS/2 programs with PAS sounds. You can use either with Win-OS/2. If you have the PAS+ card, high IRQ and DMA channels may not work correctly. Try using Low IRQ (below 8) and DMA channels (below 4).

For MMPM/2 support, if you have a PAS+ card, you'll need to change the *mmos1.ini* file after installation. Under the heading: [ibmwavepas1601], you will find the **parmstring** parameter. Change the string **BPS=16** to **BPS=8** and digital audio will work.

For DOS applications, don't add the device driver *mvsound.sys* to your *config.sys* file. Instead, for applications that require *mvsound.sys*, create a desktop object for the application, then fill in the working

directory field of the General page. Then, click on the DOS Settings button, and select the DOS_DEVICE field. Put the appropriate path and name of the *mvsound.sys* file, and append the correct DMA and IRQ to the end of the line. For example:

`c:\proaudio\mvsound.sys /d:5 /q:12`

would set the card to use DMA 5 and IRQ 12. These settings *must* match those you set for OS/2. If this setup does not work, check with MediaVision for the latest *mv-*

sound.sys driver from the Media-Vision BBS or from the MULTIV forum on CompuServe.

If you elect to use the PAS side for Windows, setup is a bit trickier. There are two types of installation mechanisms for Windows drivers, the first, for early boards and Windows drivers, requires you to bring up the Win-OS/2 Program manager. Pick File, the Run from the Program Manager menu and execute *a:\install.exe* (assuming the drivers are in the *a:* drive). Follow through the installation instructions, but do not reboot Windows yet. Open up the Drivers icon again and set up the sound board. Make sure the proper I/O address and IRQ are selected. Now, you should exit Win-OS/2 and bring it back up. You should hear the "Ta Da" sound file being played.

Win-OS/2 will not provide sound while running in enhanced

Table 4: Shareware OS/2 Games.

Many shareware games are available for OS/2. The difference between shareware and freeware is that, if you find yourself enjoying and using shareware, you should pay the software's developer. All of these shareware games can be found in CompuServe's OS2USER forum, section 16.

FILE	SIZE	PRICE	DESCRIPTION
CONQUE.ZIP	106,040	\$25	OS/2 space-conquest.
DCHES.ZIP	90,405	\$10	Dungeon Chess.
FMCRRS.ZIP	176,167	\$28	Solitaire (English & German).
HELRI2.ZIP	176,525	\$10 - \$45	Heli Rescue.
MAH2TE.ZIP	308,864	\$25	Mah Johnng.
MJS-11.ZIP	52,174	\$20	Mah Johnng solitaire.
POKER1.ZIP	32,768	\$5	Poker Solitaire version 1.10.
ROIDS2.ZIP	237,758	\$6	Super Asteroids with multimedia sound.
XWORD.ZIP	154,512	\$35	Crossword puzzle.



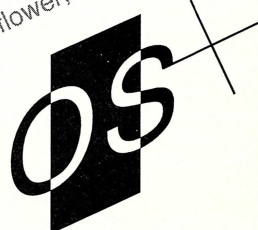
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mode. It may be necessary to patch the *vdma.sys* drive; check with MediaVision technical support.

Sound Blaster cards

Eight-bit Sound Blaster cards with the OPL0 chipset (the very first model of Sound Blaster) are not supported under OS/2, nor can drivers ever be written for this model. If you have this version of the Sound Blaster card, consider replacing it with a newer model. If you have a later version of the Sound Blaster 8-bit card, it should work fine. If you're trying to run the Sound Blaster 16 and ASP cards under OS/2 2.1, and have difficulties, check out the box on page 38; this technique will solve the problem.

Some DOS games such as Wolfenstein 3D or the Carmen Sandiego series contain both digital sounds and MIDI music. Under OS/2 with a Sound Blaster, the FM

synthesizer chip does not get properly initialized, and these games fail to produce the MIDI music and MIDI sound effects. There are two possible solutions. The first is to run the *playmidi.exe* program that comes with your Sound Blaster card. Play a short MIDI song to reset the card (use a batch file to run SBMIDI to load the sound driver, then run PLAYMIDI). The second choice is to use the *fmrst3.exe* program (available on CompuServe's OS2USER forum in section 3) and follow the instructions included with that program.

When running Windows applications under OS/2, it may be best to REM out the *audiovdd.sys* line from your *config.sys* file. If that driver is installed, the first time you run any Windows application, it will prevent all other Windows applications from using sound until all Windows applications are

terminated. When you REM out *audiovdd.sys*, you may be able to get multiple seamless sessions using sound.

Do not run the *testsb16.exe* program from Creative Labs, as it will hang the DOS VDM. It cannot be killed and will remain running until OS/2 is rebooted.

If you receive a SYS 1201 error on boot up using Sound Blaster version 1.x cards, you must upgrade the DSP module; a new DSP chip is available from Creative Labs.

It is often confusing to have to configure various DOS VDM parameters to get games up and running under OS/2. If you follow the settings in Table 2, most of the DOS-based games will run. Be sure to allocate the appropriate DPMM, EMS, or XMS memory as denoted in your application installation notes. Also, identify applications that require the use of UMBs (upper memory blocks), and adjust DOS_UMB accordingly.

OS/2 game availability

At the time of writing, several commercial OS/2 games have been announced but are not yet shipping, including Galactic Civilizations, Doom, SimCity, and SimCity 2,000. The only finished game that's available today is OS/2 Black Jack (\$50), from Reed Software, (702) 456-3737.

Until these other games are ready, you'll need to satisfy your cravings for native OS/2 games with freeware and shareware offerings. You can check out local bulletin boards, the Hobbes OS/2 CD-ROM, and other sources. Table 3 and Table 4 list many of the freeware and shareware games available in CompuServe's OS2USER forum.

Eric Pinnell is an OS/2 developer based in Montreal West, Quebec. He can be reached via CompuServe as 70031.435, or Internet as 70031.435@compuserve.com.

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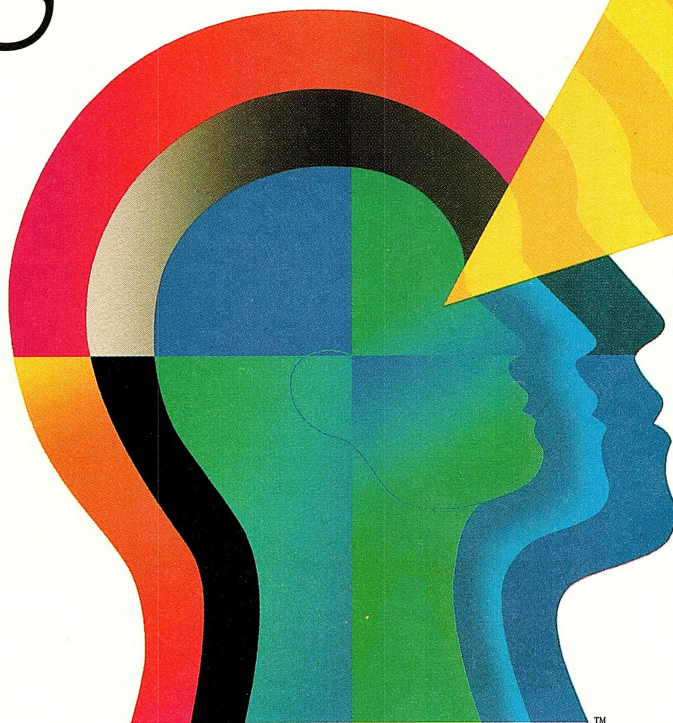
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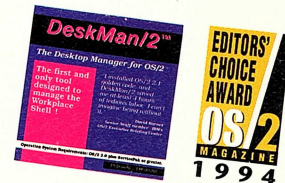
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Object-Oriented Productivity

Shouldn't we store data by project, rather than by originating application? **By Brian Johnson**

Let's think back to those long-ago days when you worked in an office without computers. You had 200 clients and you generated and received about 20 or 30 documents each day. Those documents included correspondence, phone logs, data sheets, and other fill-in forms that your company used.

Did you store all the phone logs in a single phone-log file? Of course not. Did you store all your correspondence in a single "Correspondence File"? No way. We could go on, but you get the point. The way we've always worked is to create folders for individual clients or projects. We access the different types of data we need by pulling the client's folder. Then, we have all the pertinent information about that client in front of us.

Enter the PC

The introduction of the PC into the business environment ushered in an era of increased productivity, but with certain limiting factors. DOS got users into the habit of first opening a program and then opening documents from within the program. Of course, the easiest way to do this was to place certain types of documents into default directories. The word-processing documents went into one or more word-processing directory, the spreadsheets went into another, and so on. The introduction of DOS shells and Windows made it possible for users to conveniently open a file directly by association, but these shells

didn't do much in the way of helping the user set up the storage spaces and organize their data.

OS/2's Workplace Shell (WPS) finally makes it possible for PC users to easily organize and access their data. If you're still opening documents and files by starting a program and clicking on File Open, you're not using the WPS as efficiently as you could be. What we can now do, finally, is create folders that contain all the pertinent data that we require, not only making access to information easier, but simplifying backup, management, and data security.

Objects, files and templates.

Your desktop is a folder. It is also a directory. Thus, whatever you place on your desktop gets placed into the desktop folder. The folders you place on your desktop are subdirectories of the \desktop directory. So, your desktop folder should contain mostly objects, folders, and shadows. You want to keep data files off of your desktop and out of your desktop folders because your desktop can become corrupted and, in that case, you may be required to rebuild the desktop. Keeping data files off of your desktop and out of your desktop folders helps to keep them out of harm's way.

If you create templates that contain actual files (for example, a spreadsheet that's a fill-in form you want to use for your clients), you should place them into a directory that is not on the desktop and access them via a shadow. The reason? If you back up desktop your to a floppy disk (highly recommended), you may run into space problems on the floppy and, depending on the backup program, you could lose the template documents.

How to get there

To build a new "old-fashioned" system, we're going to use many of the features available to us in the Workplace Shell, including the ability to create folders, data files, templates, and shadows. When we're finished, we'll have an automatic method of adding new clients to our client file, any added templates we need will be close at hand, and we'll have a system that makes it easier to take work home or on the road.

The first thing we need to do is to open our Templates folder, since we're going to use templates extensively with our new system. We also need to open our Drives object and select a drive in which to build our new system. Open the drive of your choice, tear a folder object off of your folder template, and drop

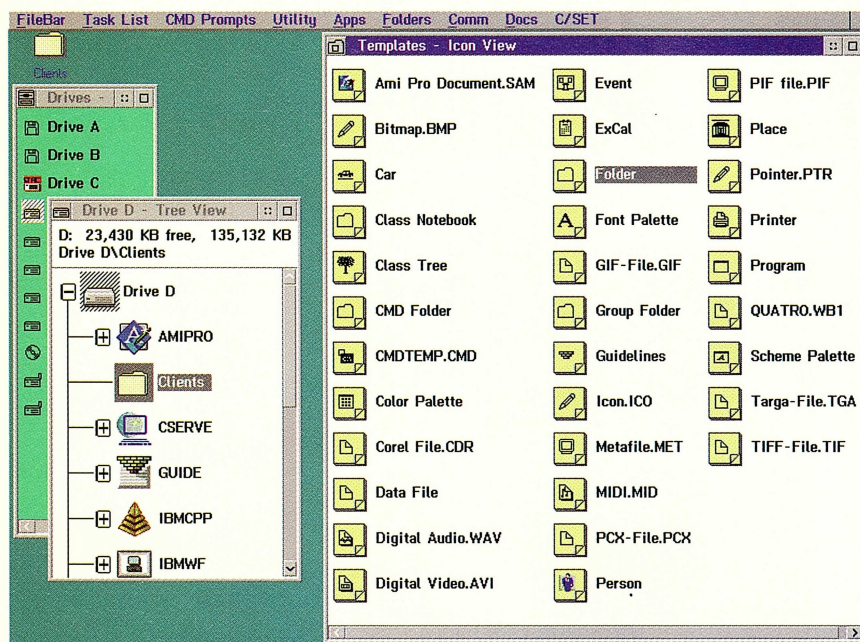


Figure 1: Dropping a folder onto a Drives object creates a new directory. The folder is renamed and a shadow is created on the desktop for access.

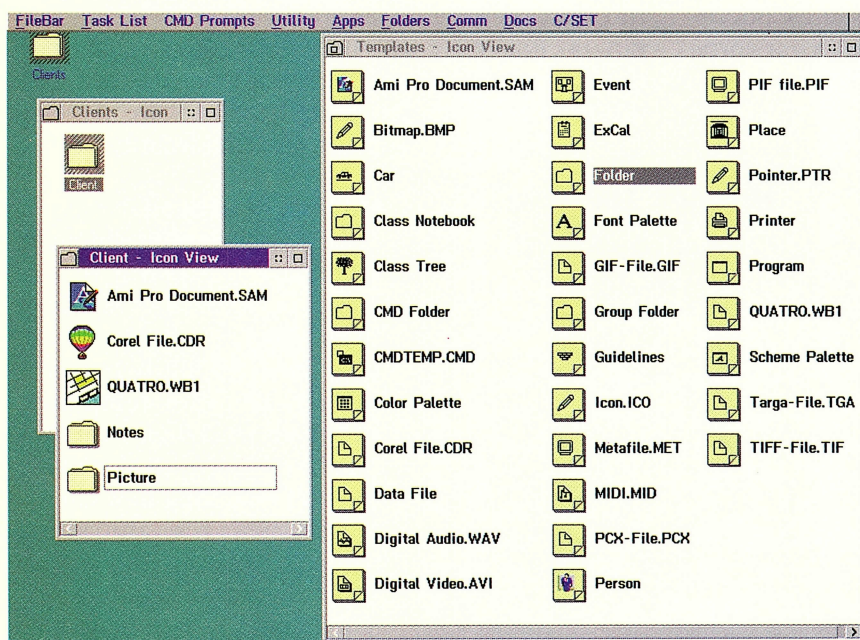


Figure 2: A folder is dropped into the Clients shadow, creating a subdirectory. This folder is populated and becomes the template for our future clients.

it onto your Drive icon. Notice that we now have a folder named Folder on the drive. Click the left mouse button on the Word folder while holding down the <Alt> key. The title is now editable. Select or delete the word Folder and replace it with

Clients. Click the left mouse button once on the folder to end the editing process.

Now, click the right mouse button on the folder to bring up the control menu. Click on Create Shadow and select desktop as the

target, then click on Create. Close the drive and the Drives folder. We can do the rest of our work directly from the desktop.

If we double-click on the Clients shadow folder on our desktop, it will bring up an empty folder, representing the Clients directory of our selected drive. It's a fairly safe object. We could delete the shadow and the Clients directory on the drive would remain unaffected. That said, we're now going to create a folder within our Clients folder, which will become the basis for our new system.

Again, tear a folder object off of the folder template and drop it into the empty Clients folder. Change the name of the folder the way you did to Client. Open the new folder.

At this point, we have to decide the types and quantity of files we need in our individual folders. In this example, we'll place one word-processing document, one spreadsheet, and a graphics file.

A matter of association

Let's pause for a few minutes and discuss file associations. Well-behaved OS/2 programs register their default file type or extension with OS/2 when they're installed, making it fairly easy to open the files you want to access directly. Many Windows programs have their associations set by the system when they are migrated to the desktop using the *migrate.exe* utility. Migrate knows the extensions to register because it reads them from a database that is installed with OS/2.

If you have a program that doesn't have a default extension registered, you can simply open the program's settings and type in *.*ext* (where *.ext* is the extension the program usually reads) under Association New. For example, an Ami Pro document has the extension *.sam*. Now, any new file you create with that extension will be accessible by the program.

Using templates

In your Templates directory, you will find a template called Data File. You may or may not have a template for a file type associated with a particular program, depending on whether or not the program installed one. You can create your own by tearing off a data-file object and dropping it into the Templates folder. Rename the new file object to whatever you want (*amidoc.sam*, for example). You'll notice that the plain icon changes to an Ami Pro icon (if the extension is associated properly). You can now open the Settings notebook for the new data file and check the Template checkbox on the General page. You now have a document template to work with. Repeat this procedure for any other templates you need.

After you've created the necessary templates, it's time to populate the Client folder. Tear off the data objects you need and drop them

into the Client folder. When you're finished, rename the document objects in the folder to whatever you want. For example, your word-processing document may be called *intro.sam*, your spreadsheet may be called *finance.wb1*, and so on. You can add as many default documents as you need. If you want, you can make one of these new objects a template for quick access when you want to add new documents later on.

Now, drop another folder into the Client folder and rename it Notes. Open Notes and copy the generic data File object from the Templates folder to the Notes folder. You'll use this template to tear off and create new text files whenever you need to. Close the Notes folder.

The final object we'll add to our example is another folder, simply to show you what is possible with objects. Tear a new folder off the

Folder template and drop it into Client folder. You should now have a set of data files and two folders in this file. Rename the folder entitled Folder to Picture. Set up the objects within the Client folder however you want, then close the folder.

Now, click the right mouse button on the Client folder object and open the Settings notebook. In the File page, check the Work Area box, and in the General page check Template. Close the Settings notebook. You now have a complete client template to work from. To use the new template, tear a folder off of it and drop it into the Clients folder. Rename the object to that of the actual client and open the folder. You'll see that everything we've created is in the new folder, all ready to go.

Look at that empty Picture folder we've created. One option would be to use that folder to store graphics files related to our client. But let's

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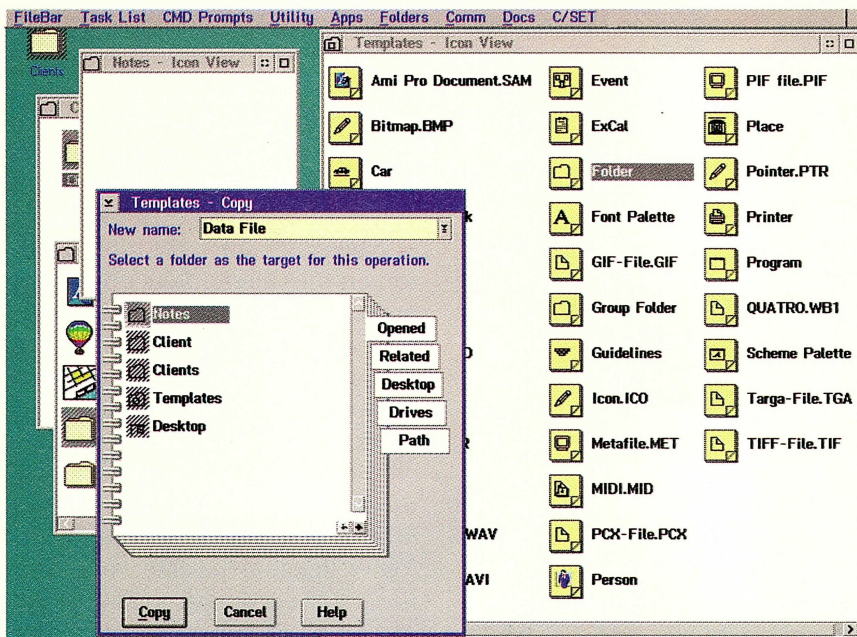


Figure 3: We copy a Data File object to the Notes folder in our Client template. Now, we have a quick way to create notes within the folder. We could perform this procedure with any object.

resize it to fit your needs. You can make it small and place it in a corner so you know exactly what you're working on when you open that client's folder. Close the client's folder and you'll see that the Picture folder will close with it. The same will happen with any other documents you have open when you close the folder. Open the folder again, and you'll see the logo go back to where you placed it before.

No hard and fast rules

You may be wondering why we didn't place the company's bitmap file into the new Client folder. First of all, bitmaps tend to be large and

More about associations.

For an association to be effective, the program with which you are associating an extension must be able to take a data file's name as a command-line argument. For the most part, major OS/2 and Windows programs are capable of this. You can run into problems, however, when a program is not able to take a zero-length file as an initial file.

Corel Draw 2.5 for OS/2, for example, is one such program. In some cases, it has difficulty taking any file as a command-line parameter unless the initial welcome box is set to Off. To turn it off, you need to edit the *corel-drw.ini* file, which can be opened with *e.exe* or any other text editor and, in the [CDrawConfig] section, change the **Show Welcome** parameter to 0. You should now be able to open Corel 2.5 files directly.

As far as zero-length files go, the problem is that when you try to tear a data object and make a new Corel Draw template, the new object will not be accepted by the program. The solution? Create a real Corel Draw file and turn that object into a template. Simply place the word template in the corner of the template picture, then save the file under any name you choose. You can then place the file in a Templates directory and select Template in the object's settings notebook. Now, you are copying a Corel Draw file every time you create a new object, but at least you'll be able to maintain continuity and open new objects directly.

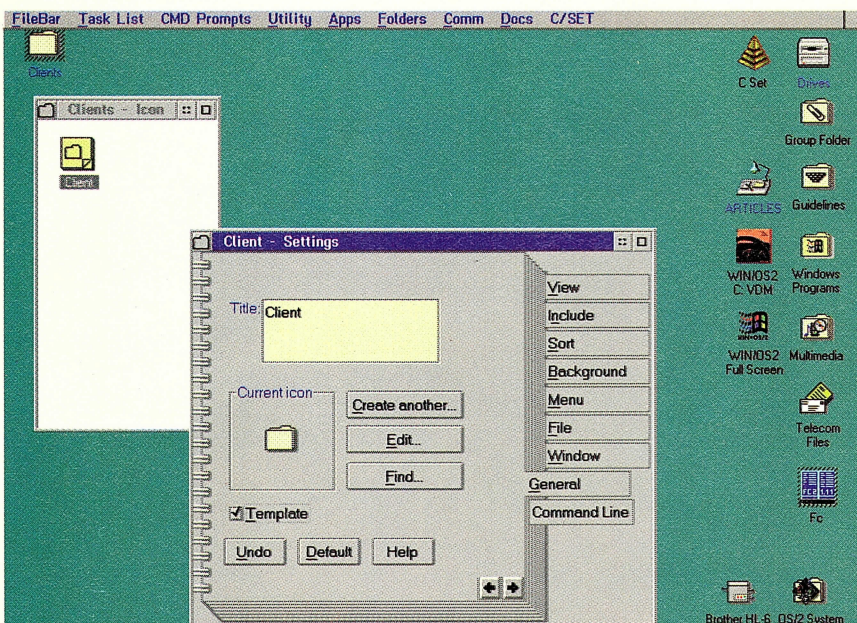


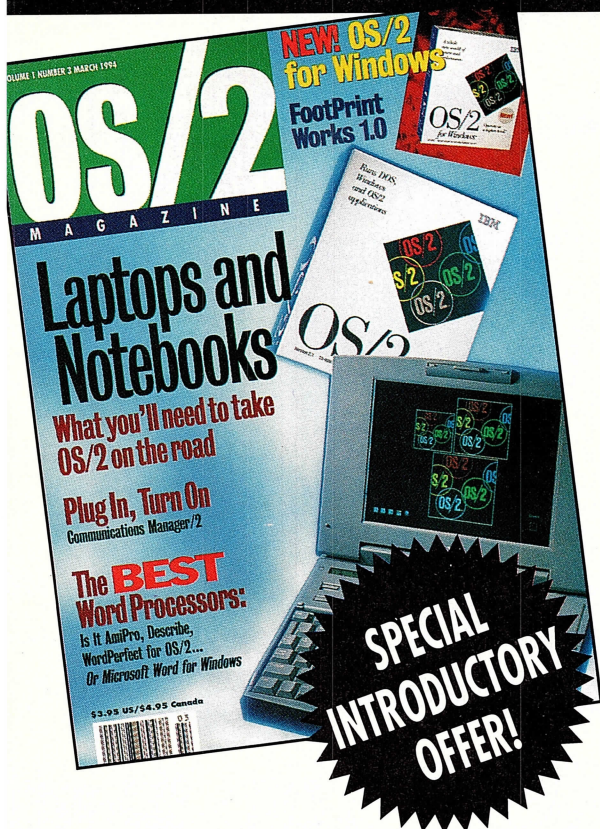
Figure 4: After creating our Client folder, we make it a template.

try a better plan. If you store bitmap files as graphics, you can use a folder object as a simple picture viewer. You can open the Settings notebook for the Picture folder and, under Background, uncheck the Color Only checkbox. You can then use the Find checkbox to search for a

bitmap related to your client. It can be a scanned logo, picture, or whatever. Select the bitmap, then check the Scaled Image radio button. Close the Settings notebook and open the Picture folder.

Your bitmap will probably be squished into the folder area, so

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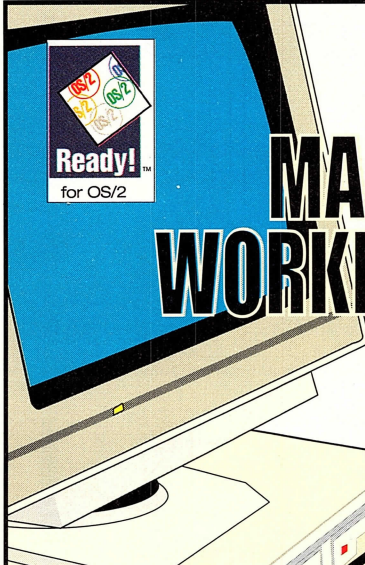
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more efficiently kept on compressed drives, saving tons of space. In this case, it's not an important part of the client record, so we'll keep the folder as clean as we can. If you prefer to work with most of a particular type of document in a set directory, you can still use our example to access all the data. In this case, you can simply create a shadow of the file you need to access and place it in the client's folder. The files won't all be there, but they are equally accessible.

So, why keep the files in separate client subdirectories? First of all, you can simply take the particular client's folder and drop it onto a floppy object to back up the entire folder and make it portable for work at home or on the road. In addition, network managers can more easily control access to client-related documents without unnecessarily restricting access to other information. Finally, this method makes sense. It moves us closer to the paperless office because it eliminates searching for on-line documents that made it easier to just print the document and access it from a paper folder.

We touched on the fact that you can destroy the shadow object we created to access the client's directory and that you can delete that shadow without affecting any of the data in that particular directory. This is true, but when we open that folder, the folders inside are deleteable, along with the data they contain. If this vulnerability is a concern, you can access these folders by creating shadows and placing them on or in another folder on your desktop. Remember that shadows are secure at the level at which they are created. Subfolders and data files accessed from the shadow folders are deleteable.

The rest is up to you

Of course, this article only presents suggestions for users who want to organize themselves under OS/2.

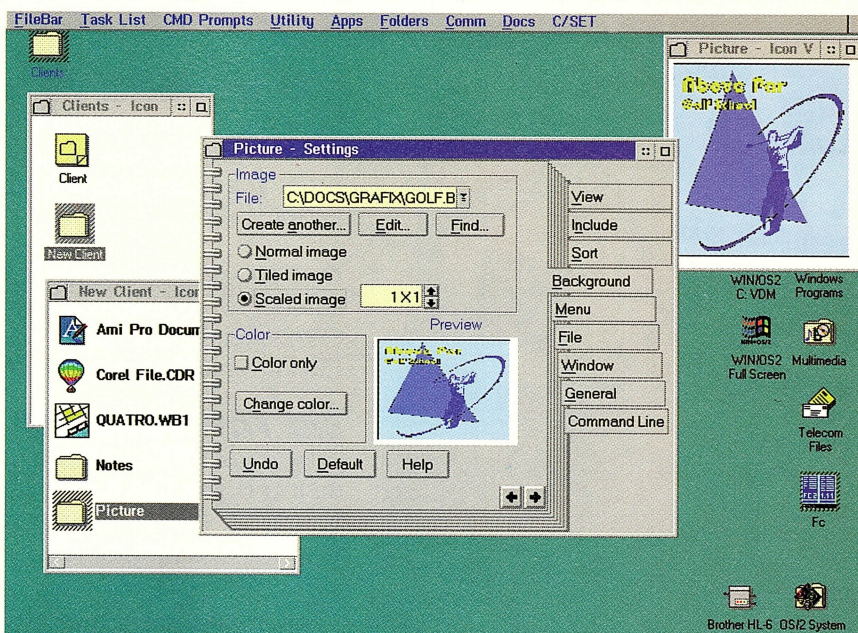


Figure 5: After using the template to create a new folder, we select a bitmap file for our Picture folder.

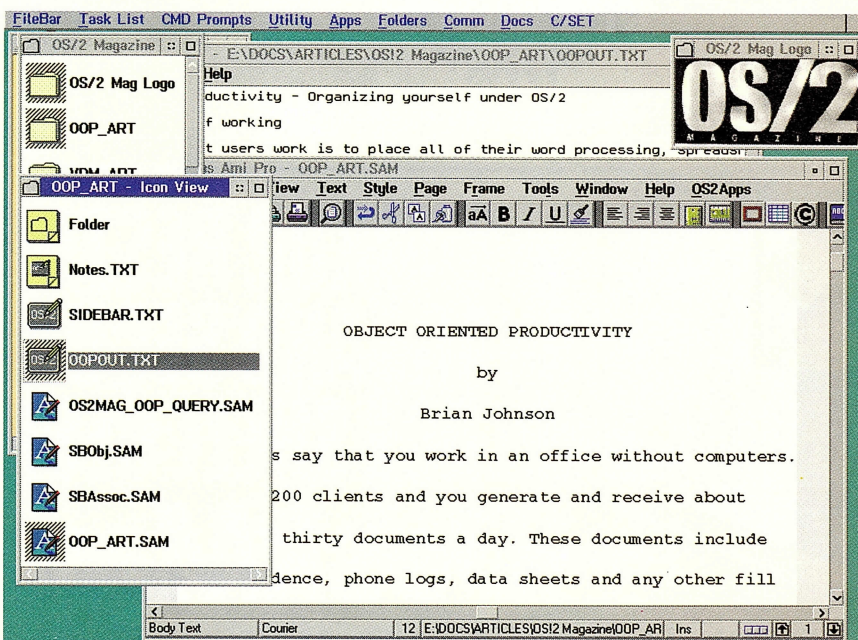


Figure 6: We aren't limited by any rules. Notice the extra Notes and Folder templates. You can keep any objects you might need close at hand.

Think of what we've discussed as a completely customizable template that you can use for new ideas about how to work under OS/2. One thing is certain: The way that you work under OS/2 is limited only by your imagination.

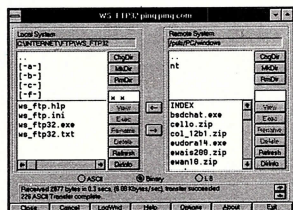
Brian Johnson is a freelance writer and computer programmer based in Orlando, Fla. He can be reached on CompuServe at 72322,3611 and on the Internet at 72322.3611@compuserve.com.

How to Cruise the Internet Without Being Taken for a Ride.

All Internet Providers Are Not The Same.

It seems as if every Tom, Dick and Harriet has decided to jump on the Internet bandwagon. Once they find out it is a simple matter of buying a computer and linking it to the net, they hang out their shingle and proclaim, "We are the Internet."

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Internet and add more as we grow. We are currently using three different backbone providers in order to provide redundant links.

What Software Do You Support?

Most companies won't provide any software support! They believe that it is **your** responsibility to get your software installed and configured

properly, even if you're not sure what software you require. Another important bit of information is their customer support hours.

Just because they are open from 9 to 5 doesn't mean your computer will accommodate you by breaking down during regular business hours.

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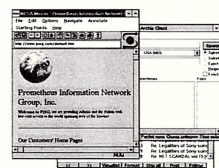
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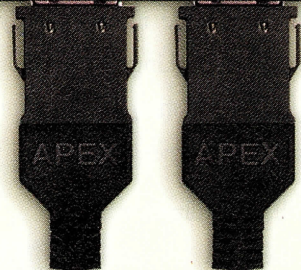
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OS/2 Calling

OS/2 Communications Programs **BY STEVEN J. VAUGHAN-NICHOLS**

The most valuable tool an OS/2 user can own is a modem. You'll find more OS/2 software as shareware on on-line services than you'll ever find in a software store. To hunt this software down, you'll need communications programs. Fortunately, with Hilgraeve's HyperAccess/5 version 3.01, Multi-Net Communications' PMComm version 2.20, and Oberon Software's TE/2 version 1.30, there's no shortage of native OS/2 communications programs.

All of these programs do the same basic job. They let you connect to an on-line service or bulletin board system (BBS) with a simple terminal interface. Once you're on a service, these programs enable you to use its character-based interfaces to send E-Mail, engage in on-line conversations and, need I add, upload and download files.

To enable you to successfully perform these tasks, communications programs must provide several features. First, they need to emulate a terminal type that the service supports. For most casual users, the ubiquitous VT-100/102 emulation is all they will ever need. Business users, however, with a need to call in on minicomputers and mainframes, need a larger selection of terminal emulations.

The right stuff

A good communications program must also support a variety of data-transfer protocols. Z-Modem support, the fastest transfer protocol around, is a must, but simply supporting Z-Modem isn't enough. If you're a CompuServe user, you'll want CIS-B+ support because this

proprietary protocol is the fastest that CompuServe supports. Old, slow Kermit is also handy to have for connecting with the mini/mainframe world.

Ease of use is also important. The ideal communications program doesn't get in the way between you and on-line information.

A top-notch OS/2 communications program is tightly tied to OS/2. You can hardly find a job better suited for OS/2's multithreaded multitasking than communications programs.

Some users also need network support from their communications program. For example, if you access the Internet via a TCP/IP direct connection, having a communications program that can double as a true terminal emulator is a real plus. You may also need a communications program that can access either a network modem pool or a network modem like Shiva's NetModem/E.

The wrong stuff

To some extent, one of the programs I looked at came through. In other areas, however, none of the programs cut the mustard. One problem isn't the programs' fault. Quietly, but surely, on-line services are moving to proprietary frontends. Some services, like America Online, eWorld, and Interchange, are completely inaccessible unless you're running their Windows or Macintosh interfaces. Others, like BIX and CompuServe, still support character-based interfaces but are no longer investing time or money into improving these interfaces.

The general-purpose communications program is growing less use-

ful in a world of more specialized interfaces. Unfortunately, except for CompuServe, with their CIM for OS/2, none of the services are making allowances for OS/2 users.

Even in BBSs, there's a trend towards proprietary interfaces. Fortunately, in the BBS world, such interfaces are often built around a common interface standard: TeleGrafix's Remote Imaging Protocol (RIP). Unfortunately, no OS/2 communications program currently supports the RIP standard.

OS/2 communications programs are also weaker than their Windows and DOS cousins in that they don't support faxing. This situation is especially regrettable since OS/2, by its very multitasking nature, is more suitable for background fax sending and receiving than the older operating systems.

All things considered, for basic telecommunications, there's a lot to like about OS/2 communications programs.

HYPERACCESS/5 VERSION 3.1

HyperAccess/5 from Hilgraeve is a program with a long and distinguished history. While this new version adds more victory laurels to its honors for functionality, its character-based interface is beginning to get a little long in the tooth.

Let's start with the good news. HyperAccess/5 supports every important data-transfer protocol. Z-Modem, Kermit, CIS-B, and Hilgraeve's own HyperProtocol are all present and accounted for.

The program is ready for business computing with IBM3101 and ADM-3A emulations, along with the ever-popular VT100 and VT220 emulations. If you work

Review

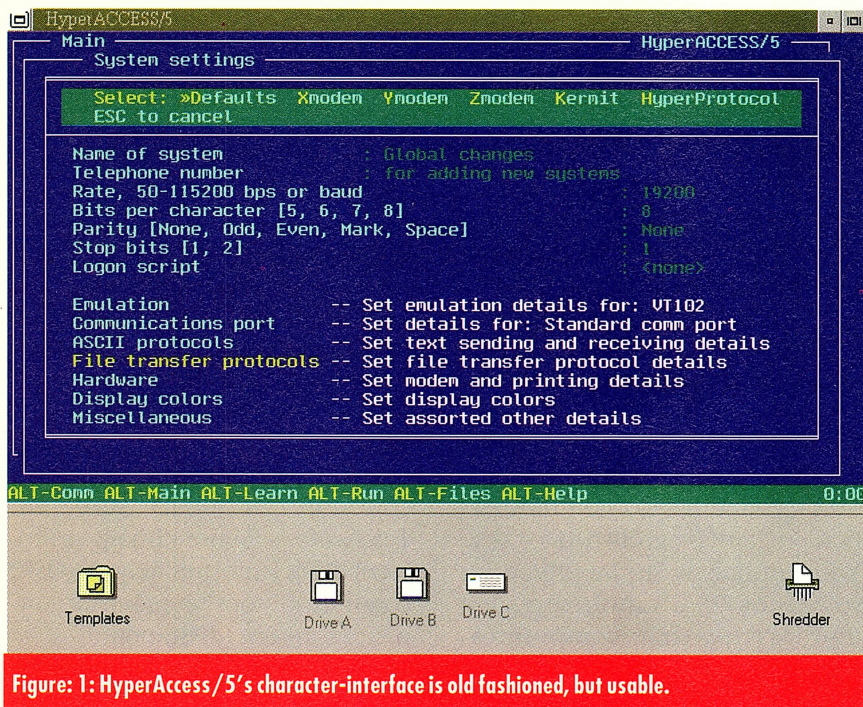


Figure 1: HyperAccess/5's character-interface is old fashioned, but usable.

with IBM big-iron, you'll especially appreciate HyperAccess's IBM 3278 emulator. This terminal emulator lets your PC act as a VT100 terminal, with 3270 keys, to main-frame hosts that have the proper protocol converters.

HyperAccess/5's scripting capacities are second to none. The script language resembles C in its virtues, power, vices, and complexity. Fortunately, with the program's macro capacities, you may never need to deal with the raw code.

The dialing directory integrates nicely into these automated capacities. The directory, which can accept up to 2,000 entries, can be set to queue up automated sessions so your computer does your on-line work while you're catching 40 winks.

You may not want to sleep much with HyperAccess active. The program enables your system to be remotely controlled by other HyperAccess programs. While its remote-control facilities are limited (you can only run character-based applications), this ability is still a

nice addition to a full-featured communications package.

You can also use the program to run its own BBS. You'll never mistake HyperAccess' BBS for a top-of-the-line BBS but, for the price, you can't beat it.

HyperAccess works and plays well with a great variety of communications hardware. Besides getting along with a wide variety of modems, the program supports INT14-aware network modems. It would be better still if the program could support the more reliable NetWare Asynchronous Service Interface (NASI), but you'll have to wait for the next version for that capability.

HyperAccess is the only program with built-in virus protection. Your downloads are automatically screened for viruses, so you don't have to find them the hard way.

The bad news is that HyperAccess is an add on to the OS/2 environment. For example, the integral editor is fine, but its command syntax is nothing like OS/2's common user access (CUA) inter-

face. You also can't cut and paste between it and the Clipboard. The same is true of the program's otherwise great text buffer. It's neat to be able to ramble through up to 250K of your on-line session history, but it would be neater still if you could export it on the fly to another application.

The character-based interface, while great for a DOS-based world, simply isn't good enough in a GUI world. Besides not having OS/2's command syntax, the mouse-driven interface is clumsy. For on-line help and installation options, you must work through the program's keyboard interface instead of OS/2's help facility and Notebooks.

All that said, there's still a lot to like about HyperAccess. It's just that HyperAccess/5 really isn't a comfortable fit with OS/2's Workplace Shell (WPS). Still, if you can live with that, you'll be very happy with HyperAccess.

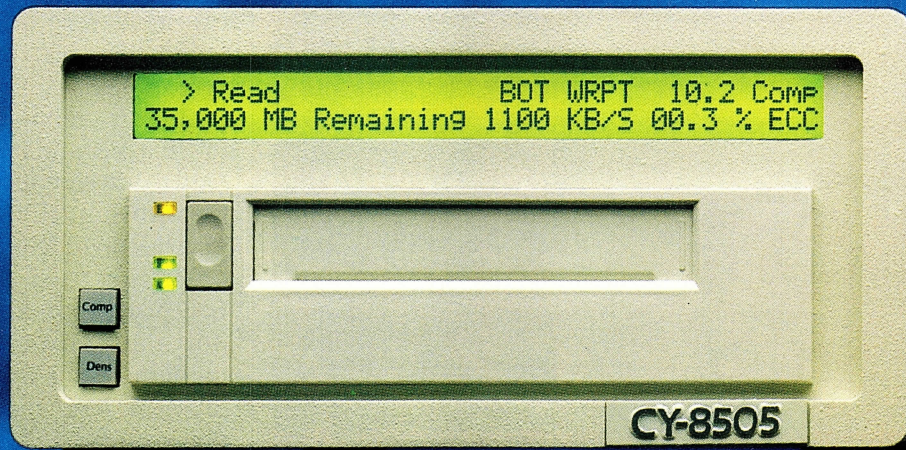
TE/2 VERSION 1.3

Oberon Software's TE/2 is a horse of a different color. This product is an OS/2 application through and through. You'll like that part, what you may not care for is that it's an OS/2 character-based application, not a Presentation Manager application.

TE/2 has all the basics. It supports X-, Y-, and Z-Modem, and their most popular variants. Kermit, however, is not supported. CIS B+, confusingly, is supported, but it's not available as a menu choice. Instead, you start the data-transfer process using CIS's menu and TE/2 automatically uses CIS B+.

Bare functionality is the name of the game when it comes to terminal emulations. You'll find no 3270 emulation here, but you do get the essential emulations: ANSI, TTY, VT100, and IBM3101. VT users should note, however, that this

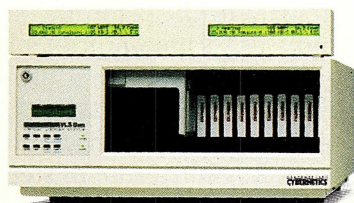
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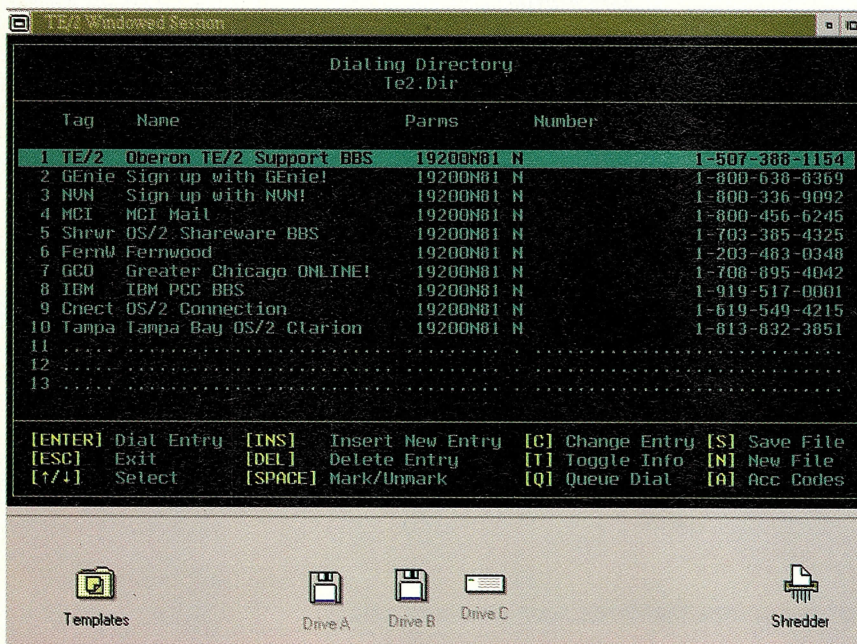


Figure 2: TE/2 is a blast from a non-graphical past. It works, but wouldn't you rather have an application that can at least use a mouse?

emulator doesn't support the VT100's 132-column mode.

TE/2 supports macro functions for the function keys from within the program. Scripting in TE/2,

however, is extremely primitive. It doesn't have an automatic script recorder but the package does include TRECORDER, a freeware script recorder for TE/2. TRECORDER

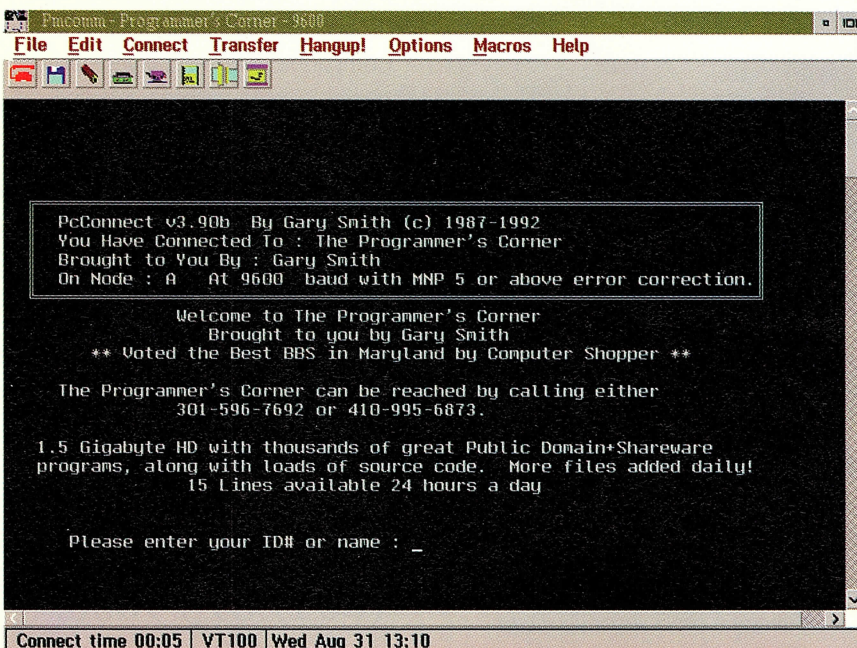


Figure 3: Windows, icons, and menu-bars, oh my! PMComm is the one WPS-compliant communications application.

works, but it's not "state of the art."

You can write your own scripts using TE/2's native script language. You can also write TE/2 programs using REXX.

Adventuresome programmers can also write REXX programs that call TE/2 script-language commands. The real question here is: "who would want to?" With other programs making scripting so much easier and more flexible, it's hard to imagine anyone wanting to go to this much trouble to automate getting their MCI Mail.

The program does support a wide variety of modems. You are not able, however, to change modems from within the main program. To change modems, you must use the CFGTE2 configuration program. TE/2 doesn't support INT14 or NASI network modems. Since TE/2 supports named pipes, clever REXX programmers who are familiar with networking should be able to work around this limitation. Still, the same trick can be managed more easily.

TE/2 also has a few oddities. It has a command to let you start a new OS/2 shell. It's hard to see the point in this ability, since you can always <Ctrl+Esc> your way to a list of active windows. It's even harder to understand when the manual recommends against using this function since running it may cause the program to miss characters from the modem.

The character-based user interface feels like a refugee from the 1980s. You can't even use a mouse with the silly thing.

Overall, TE/2 gives you the impression that it's a single-tasking DOS program in OS/2 clothing. If you want a DOS communications program, get Datastorm's Procomm Plus and run it in a DOS box. In 1995, there's simply no need for a program as out of step and time as TE/2.

Review

PMCOMM 2.20

Multi-Net's PMComm 2.20 may not be the best OS/2 communications program, but it sure feels that way. This program is the only one that really takes advantage of the WPS environment.

Like the other programs, PMComm is ready for action with support for X-, Y-, and Z-Modem, CIS B+, and Kermit. PMComm's terminal support doesn't equal HyperAccess/5's facilities, but it does support the TTY, ANSI, VT100, and VT220 terminals. Unlike TE/2, PMComm supports 132-character modes.

PMComm's script generator works well, but fine-tuning scripts requires manual programming. The generator will let you save scripts in either PMComm's own rudimentary script language or in REXX.

PMComm's dialing directory is first rate. Setting the program up to just the right setting for each on-line service or BBS is a breeze with PMComm's button and scroll-bar setup menus.

Another nice feature is the program's extended scroll buffer. This buffer can be set to hold hundreds of kilobytes of information. You can then cut and paste this information onto the Clipboard for transfer to other OS/2 programs.

All in all, PMComm's interface is a true pleasure to use. The program's icon bar puts all of the essential functions only a mouse click away. If you know how to use any PM program, you'll feel at home with PMComm. The program doesn't support Notebooks for its settings, but the setting windows are so easy to work with that

you'll never miss Notebook.

PMComm is not perfect. It directly supports only a small number of modems and its network-modem support is limited.

Perfect or no, PMComm is a fine little communications program and my personal pick of the lot. Users with needs that are specifically addressed by HyperAccess/5 will want to turn to HyperAccess/5. Best of all would be a program that combines HyperAccess/5's features with a PMComm-style interface. In a less-than-perfect world, however, PMComm is the OS/2 program of choice for general users.

Logout

OS/2 communications programs still have a way to go before they can equal their Windows cousins. I'd love to see a program with sup-

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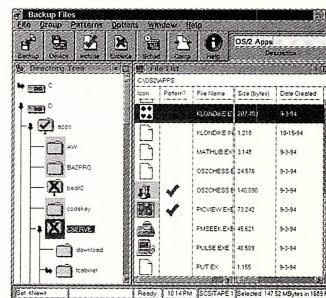
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Review

port for RIP, network modems, dynamic data exchange (DDE), multiple terminals, and a totally PM CUA-compliant interface.

For the vast majority of users who just want to get their Internet mail and download files from CompuServe, any of these programs will serve you well. TE/2 is just not the equal of the others and, at approximately the same price, it can't be recommended.

The unique strengths of HyperAccess/5 and PMComm make them worth picking over Windows telecommunication programs. OS/2's multitasking environment makes OS/2 inherently friendlier to communications programs. Other operating systems freeze up at the very idea of a program downloading files in the background while you're using a word processor in

the foreground, but HyperAccess/5 and PMComm never missed a beat.

You should take a lesson from them and not miss any time ordering a copy of either program. With a communications program at hand, the whole world of OS/2 online information and files will open up to you. For OS/2 users, communications programs really are the most valuable programs around.

Steven J. Vaughan-Nichols is a freelance writer working out of Lanham, MD. He can be reached as sjvn@access.digex.net.

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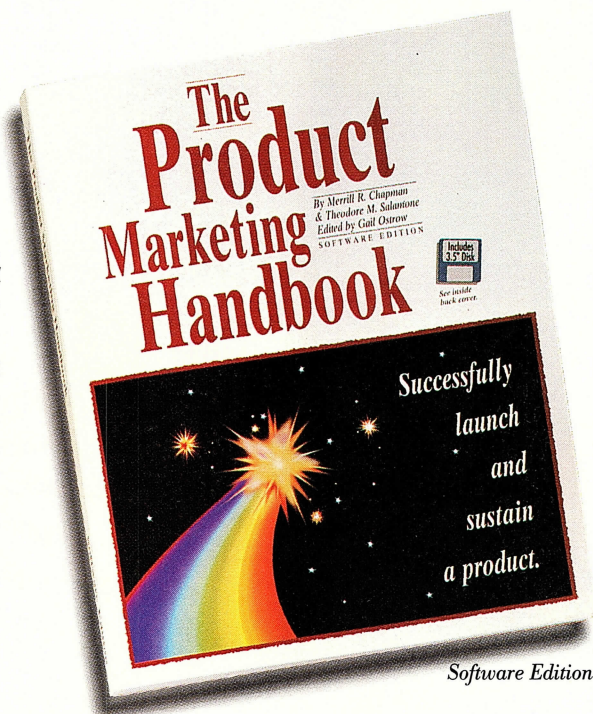
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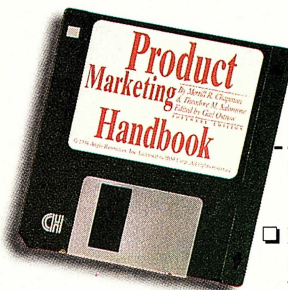
Merrill R. Chapman has been in the software industry for 15 years and has seen firsthand the brilliant marketing techniques employed by industry giants and the catastrophic errors made by companies that are no longer in business. He presently consults with and trains marketing professionals in companies that include IBM, DataEase, SUN, Berlitz and WordPerfect.



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BSE Drive 25

Portable hard disk

BSE Inc. announced the availability of OS/2 drivers for their line of parallel-port portable hard-disk drives. The drives are available in sizes that range from 120MB to 520MB. The BSE Drive 25 weighs less than 1½ pounds, including internal batteries that can power the drive for up to five hours. The Drive 25 models, which use 2½-inch IDE drives, include AC adapter/charger, data cable, and carrying case. The OS/2 driver that is used in the BSE Drive 25 is an Adapter Device Driver (ADD), which can support FAT, HPFS, or any other installable file system. The new Drive 25 models use a 16-bit controller.

Owners of older 4-bit and 8-bit Drive 25 models can upgrade to a 16-bit version for \$100. The upgrade is required for OS/2 use. Drive 25 pricing (with DOS and Windows drivers) ranges from \$499.95 for the 120MB version to \$999.95 for the 520MB option. Drive 25 is also available without the IDE drive installed for \$199.95. The OS/2 drivers sell for an additional \$99.95. Contact BSE Inc. at (602) 527-8843 or fax (602) 527-1540.

READER SERVICE NO. 159



Plus for OS/2 shuts down the OS/2 system and restarts it when power is restored. PowerAlert Plus sells for \$99. Contact Tripp Lite, (312) 329-1777 or fax (312) 644-6505.

READER SERVICE NO. 161

Accel Data-Acquisition Drivers

Find out in real time

Microstar Laboratories, a manufacturer of real-time data acquisition and control systems, has announced OS/2 2.x drivers for its Data Acquisition Processor (DAP) boards. DAP boards, which have their own on-board processors, run a proprietary DAPL operating system. The new OS/2 driver, called Accel, allows native OS/2-based applications to control DAPL programs directly. The new driver supports multitasking and multi-threaded applications, including 32-bit support for IBM C/C++ Tools and Borland C++ for OS/2. It also includes 16-bit support for Microsoft C 5.0. The OS/2 Accel driver costs \$95. Microstar's Data Acquisition Processors are priced from \$1,195 to \$3,995. Contact Microstar Labs at (206) 453-2345 or fax (206) 453-3199.

READER SERVICE NO. 162

Pro Lightning

Dueling graphics processors

Colorgraphic Communications Inc. announced Pro Lightning, a graphics adapter that uses two independent S3 Vision 864 processors to drive and accelerate two monitors. Pro Lightning, available for VESA Local Bus, includes OS/2 2.1, Windows 3.1, and Windows

RemotePoint

Cordless hand-held mouse

Interlink Electronics announced RemotePoint, a cordless hand-held pointing device that is compatible with OS/2, Windows, and DOS. Designed for use with laptops, desktops, and computer-driven presentations, Remote Point includes both an infrared transmitting mouse and a receiver that plugs directly into a standard serial or PS/2-compatible mouse port. RemotePoint uses standard mouse drivers, so you do not need to reconfigure OS/2 to use it. RemotePoint, priced at \$199, has a 40-foot line-of-sight range. Contact Interlink Electronics at (805) 484-1331 or fax (805) 484-8989.

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PowerAlert Plus for OS/2

Power to the people

Tripp Lite, a manufacturer of uninterruptible power supplies, announced the OS/2 version of PowerAlert Plus, a utility for UPS monitoring and network power management. PowerAlert Plus, which works with Tripp Lite's Smart Series UPS, graphically displays information about any UPS on a local-area network, including input voltage conditions, percentage of UPS load capacity, percentage of battery capacity, battery charge, master log of pooled alarms, scheduled self-test dates, and programmed alarm setpoints. When a power failure is longer than the UPS's battery capability, PowerAlert

Just Announced

NT drivers. The board is populated with 2MB video RAM for each S3 Vision 864—a total of 4MB VRAM and supports resolutions up to 1,600x 1,200x256, 800x600x64K, and 640x460x64K colors. Two feature connectors allow installation of frame grabbers, special-effect generators, and other accessories. The OS/2 2.1 "Virtual Display" driver allows dragging of windows and applications from one monitor to another. Pro Lightning is priced at \$700. Contact Color-graphic at (404) 455-3921 or fax (404) 458-0616.

READER SERVICE NO. 163

Pride Information Factory 1.2

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MBryce and Associates has updated its Pride Information

Factory, a tool that was designed to help corporations manage information resources. The new version provides graphics tools that offer access to the Information Factory's IRM repository. These tools support a three-tiered flowcharting scheme that helps analysts decompose a company's information system structure from overall system architecture to business process flows and job-stream design. Pride Information Factory 1.2 also includes CAD tools to design and document enterprise-wide systems. Pride Information Factory, priced at \$148,000 for a site license, works in a stand-alone environment or in a client/server LAN environment. Contact M. Bryce and Associates at (813) 786-4567 or fax (813) 786-4765, or e-mail timb1557@aol.com.

READER SERVICE NO. 164

IRMA Workstation for OS/2

Network connectivity software

Digital Communications Associates Inc. (DCA) announced IRMA Workstation for OS/2, a client-side connectivity tool that runs under OS/2 2.1 or later. IRMA Workstation for OS/2 provides protocol and gateway connectivity options, including IBM's 3270, Novell's NetWare for SAA, Microsoft's SNA Server for Windows NT, and Hewlett-Packard's SNAPplus Server. NetWare support includes connectivity over Novell's IPX/SPX protocols, as well as TCP/IP. IRMA Workstation for OS/2 is priced at \$495 for individual licenses, \$3,495 for 10-user licenses, \$11,495 for 50 users, and \$19,495 for 100 users. Contact DCA at (800) 348-3221 or (404) 475-8380 or fax (404) 442-4364.

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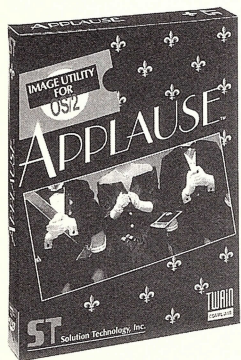
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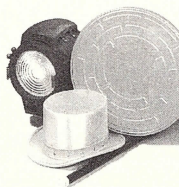
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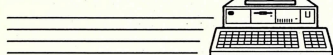
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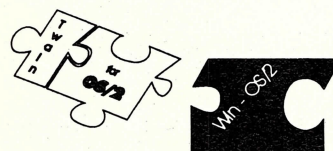
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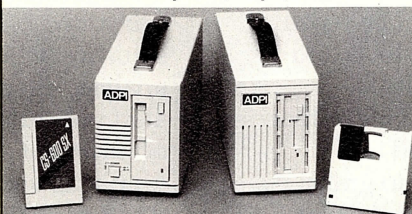


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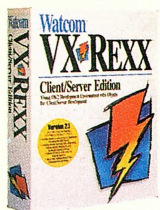
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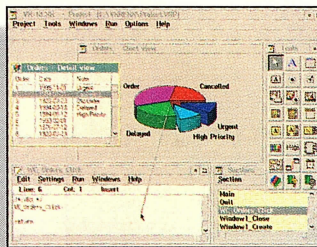
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Programming Arrays

HOW TO TAKE ADVANTAGE OF THIS
POWERFUL DATA STRUCTURE BY DICK GORAN

REXX has a powerful and unique array capability. Arrays are usually groups of variables that contain related table or list data that can be referenced with a common variable name plus a subscript or index to indicate which element of the list is being referred to. I prefer the term subscript to index, because, to me, subscript implies a base of one, and index implies a base of zero.

An example of a simple or single-dimensional array is a list with the name of each month assigned to the same variable name modified by a subscript in the range of from 1 to 12. If **March** is assigned to **month.3**, then by assigning the value of 3 to **sub**, the value of **month.sub** would be **March**. All of the elements in a stem can be initialized by assigning a value to the stem name. For example, **month. = ''** would assign a null value to all elements of the stem. However, a value can not be assigned to a group of elements below the stem level.

Arrays don't have to be declared and are simply referenced with *compound* or *stem* variables. Compound variables use a period to separate their component parts which include the stem (all characters before and including the first period) and the tail (all characters following the first period). Each token in the tail is preceded by a period. The variable that is used as the stem portion of the name is translated to

uppercase characters, as any simple variable would be. The variable names that are used in the tail are left in the case they were written.

Before the compound variable name (stem and tail) is used, each individual symbol in the variable

name is replaced by its respective value. The resulting "derived" name is used as the name of the variable. You can use an unlimited number of symbols (variables and constants) in a compound variable name, although the overall limit

Fragment 1: Tail variables.

```
/* 9412FG01.CMD - Illustrate tail variables */

/* Another classic REXX gotcha. */

x = 'blue'
bg. = ''
bg.x = 16

/* Then */

say bg.x           /* 16 */
say bg.blue        /* null string */
say bg.'blue'      /* 'blue' */

/* is correct. */
```

Fragment 2: Associative array contents.

Name=MONTH.1, Value='Jan'	Name=INDEX.Jan, Value='1'
Name=MONTH.2, Value='Feb'	Name=INDEX.Feb, Value='2'
Name=MONTH.3, Value='Mar'	Name=INDEX.Mar, Value='3'
Name=MONTH.4, Value='Apr'	Name=INDEX.Apr, Value='4'
Name=MONTH.5, Value='May'	Name=INDEX.May, Value='5'
Name=MONTH.6, Value='Jun'	Name=INDEX.Jun, Value='6'
Name=MONTH.7, Value='Jul'	Name=INDEX.Jul, Value='7'
Name=MONTH.8, Value='Aug'	Name=INDEX.Aug, Value='8'
Name=MONTH.9, Value='Sep'	Name=INDEX.Sep, Value='9'
Name=MONTH.10, Value='Oct'	Name=INDEX.Oct, Value='10'
Name=MONTH.11, Value='Nov'	Name=INDEX.Nov, Value='11'
Name=MONTH.12, Value='Dec'	Name=INDEX.Dec, Value='12'

Listing 1: Compare directories

```

/*-----*\
|
|   9412LS01.CMD - Compare two directories using associative arrays |
|
|-----*\
call RxFuncAdd 'SysLoadFuncs', 'REXXUTIL', 'SysLoadFuncs' /* 0006 */
call SysLoadFuncs /* 0007 */
/* 0008 */
directory_1 = 'd:\*. *' /* 0009 */
directory_2 = 'e:\*. *' /* 0010 */
/* 0011 */
/*-----*\ /* 0012 */
| Process 1st directory | /* 0013 */
|-----*\ /* 0014 */
index_1. = 0 /* initialize all elements */ /* 0015 */
call SysFileTree directory_1, 'tree_1', 'F0' /* 0016 */
do t1 = 1 to tree_1.0 /* 0017 */
    subscript = FILESPEC( 'P', tree_1.t1 ) ||, /* 0018 */
               FILESPEC( 'N', tree_1.t1 ) /* 0019 */
    index_1.subscript = t1 /* 0020 */
end /* 0021 */
/* 0022 */
/*-----*\ /* 0023 */
| Process 2nd directory vs. 1st | /* 0024 */
|-----*\ /* 0025 */
index_2. = 0 /* initialize all elements */ /* 0026 */
call SysFileTree directory_2, 'tree_2', 'F0' /* 0027 */
do t2 = 1 to tree_2.0 /* 0028 */
    subscript = FILESPEC( 'P', tree_2.t2 ) ||, /* 0029 */
               FILESPEC( 'N', tree_2.t2 ) /* 0030 */
    index_2.subscript = t2 /* 0031 */
    if index_1.subscript > 0 then /* 0032 */
        do /* 0033 */
            index_1.subscript = -1 /* indicate matching entry */ /* 0034 */
            iterate /* 0035 */
        end /* 0036 */
        say directory_1 ||, /* 0037 */
           ' does not contain ' ||, /* 0038 */
           subscript /* 0039 */
    end /* 0040 */
/* 0041 */
/*-----*\ /* 0042 */
| Process unmatched entries in 1st directory | /* 0043 */
|-----*\ /* 0044 */
do t1 = 1 to tree_1.0 /* 0045 */
    subscript = FILESPEC( 'P', tree_1.t1 ) ||, /* 0046 */
               FILESPEC( 'N', tree_1.t1 ) /* 0047 */
    if index_1.subscript > 0 then /* 0048 */
        do /* 0049 */
            say directory_2 ||, /* 0050 */
               ' does not contain ' ||, /* 0051 */
               subscript /* 0052 */
        end /* 0053 */
    end /* 0054 */
/* 0055 */
exit /* 0056 */

```

for the derived variable name is 250 characters.

Some confusion may arise (particularly for REXX programmers from the mainframe world who have been accustomed to using uppercase variable names) when using mixed-case variable names within a compound variable. The confusion occurs because OS/2 REXX uses these symbols literally when they are used as part of the tail of a compound variable, but translates them to uppercase when they are used as a simple variable.

Fragment 1 contains an example of what Charles Daney of Quercus Systems (known for their REXX interpreter, Personal REXX) likes to call a "REXX gotcha."

In **bg.blue**, REXX is looking for the variable **BG.BLUE**. The tail is case-sensitive, making it different from **bg.blue**. REXX makes a distinction between the name of the variable and the symbol that refers to it, which is **bg.blue**. The compound variable name **bg.'blue'** is the concatenation of **bg.** (null string) and **'blue'**.

Associative arrays

Unlike so many other programming languages, the value assigned to the variables used in the tail of a compound variable doesn't need to be numeric. In fact, the value of the variables may contain any value, without exception. This fact lends itself to the concept of associative storage or arrays.

By using the example of a month table, we could build an associative array that would appear as shown in Fragment 2.

We can reference the sequential array to obtain the month abbreviation or we can reference the associative array, using the value of the sequential array to obtain the subscript of the sequential array.

When an array element is referenced with a non-sequential tail, REXX finds the appropriate string with a tightly-written search func-

tion—the result being better performance than could be obtained at the REXX source level.

How many times have you wanted to compare two lists and process the like or unlike entries? For example, have you ever had a need to compare the contents of two directories? It is more than likely that you have either written merge logic in your program or read one of the directory's entries into an array of some sort and processed the second directory against the array created from the first directory. If either of the directories or lists are unsorted, it can lead to a long-running program, because of the search time that results from the repetitive scanning of the array built from the first list.

If we initialize all of the elements of the associative array with a recognizable value that would not conflict with the sequential number of the list entries (for example,

zero), we could test for the presence of a file name in the array by simply using its name as the subscript. Listing 1 (which is also available on CompuServe in the OS2AVEN forum in Library 8 as *rxls02.cmd* or via FTP from *ftp.netcom.com: /pub /dgoran* as *9412ls01.cmd*) is a working example that will compare two directories and display the names of the non-matching entries.

Lines 9 and 10 can be altered to refer to any directories you choose.

Lines 15 to 21 initialize the associative array for the first directory (*index_1*) to zero and build the sequential array and the associative array for the directory.

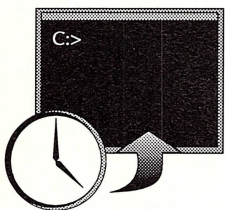
Lines 26 to 40 do the same for the second directory and write a message to the screen for all files that do not occur in the first directory (the corresponding index entry does not have a value greater than zero). And, if the **directory_2** entry exists in **directory_1**, the

index for the **directory_1** entry is set to minus one to distinguish it from the positive value it had when the index was built. Finally, lines 45 to 54 list any entries in the first directory that do not exist in the second directory (the index value is neither zero nor minus one).

As shown in Listing 1, only three iterations are necessary to compare both directories to each other, regardless of the number of items in each directory. This technique provides significant savings when working with unsorted lists.

Dick Goran is the author of the REXX Reference Summary Handbook, an OS/2 Reference. He has been in the computer industry since 1961 and was in the IBM mainframe systems software development business until 1987. He can be reached at 71154, 2002 on CompuServe, HONE81 (DEV4672) on IBMLink and receives Fido Netmail at 1:209/705.

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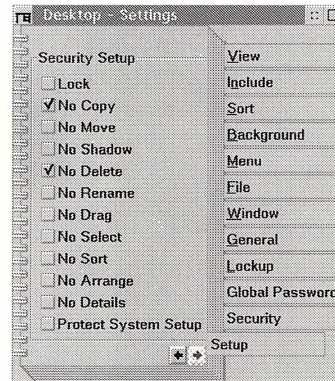
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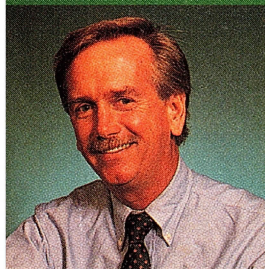
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A Brief History

A CONTINUOUS THREAD FROM 1987 TO 1994 BY DICK CONKLIN

If you are a relatively recent convert to OS/2, you might be surprised by the number of changes and improvements that have preceded today's versions. Several major updates of OS/2 have been released since it was originally announced in 1987, as well as a series of more informal Service Pak free upgrades that fix bugs and add device drivers.

OS/2 1.x: Not just for PS/2s

When Intel unveiled the 80286 processor in 1984, three years after the first PC, not much software supported its multitasking program-protecting features. DOS was still DOS, whether it was running in the 80286's real mode or the 8086-compatible mode. The new CPU offered, essentially, no improvements, other than higher speed. In 1985, the 80386 arrived. Although it had the ability to run multiple-protected DOS programs, no operating system could support that feature.

In April 1987, IBM and Microsoft formally announced OS/2 1.0. The event coincided with the unveiling of IBM's new PS/2 series of computers. The overlap confused many people who thought that OS/2 required a PS/2 to run, or that a PS/2 required OS/2 to run. Nothing was further from the truth. DOS ran fine on the PS/2,

Several major updates of OS/2 have been released since it was originally announced in 1987.

and later, OS/2 would appear on non-IBM hardware. Many people on the OS/2 development team wanted to make OS/2 an 80386-or-higher operating system so that it could take advantage of the chip's 32-bit architecture and other features. Others, however, worried about the installed base of 80286 machines. Temporarily, the 80286 protectionists won.

OS/2 1.0 didn't ship until December 1987, when it was released without a graphical user interface (GUI). The interface appeared in OS/2 1.1 a year later when Presentation Manager (PM) was ready to be released. OS/2's DOS-Compatibility Box was called the DOS Penalty Box by many customers. Later, it was replaced by OS/2 2.0's Multiple Virtual DOS Machines (MVDM). OS/2 1.1, 1.2, and 1.3 arrived at yearly intervals.

OS/2 1.1 introduced PM, and 1.2 brought dual boot, REXX, the High Performance File System (HPFS), and the Information Presentation Facility (IPF). Version 1.3 fixed some bugs and added the Adobe Type Manager. But, by then, Microsoft and IBM were going their separate ways and Windows 3.0 had arrived. Sales of the 80386 exceeded the 80286 and, once again, a better system was needed—and soon.

OS/2 2.x—starting again

IBM had promised to deliver OS/2 2.0 by the end of 1991, but didn't make it. A major beta-test effort, involving developers and end users, caused a torrent of feedback from people requesting fixes and enhancements. The object-oriented WorkPlace Shell, a Macintosh-like user interface replacing PM's Windows-like GUI, was a major change for OS/2.

When OS/2 2.0 made its debut in April 1992, it sported Windows 3.0 compatibility, which enabled users to run DOS, Windows, and OS/2 applications together. It also included a set of simple applications (or applets) to get you started. IBM included some on-line help, an interactive tutorial for the OS/2 beginner, an on-line reference manual, a new guided installation program, and expanded explanations of error messages.

Table 1: OS/2 versions.

Version	Date	Comments
OS/2 1.0 (Code name: CP DOS)	12/87	Required an 80286 or higher with a 3MB memory minimum; supported 32MB drives; used 64KB segments; offered multitasking, multithreading, and DOS-compatibility box; interface was character-mode only
OS/2 1.1 (Code name: Trimaran)	11/88	Added Presentation Manager graphical user interface; had new Graphical Programming Interface (GPI), which is also known as the Graphics Engine.
OS/2 1.2 (Code name: Sloop)	10/89	Added Installable File System (IFS) and new High Performance File System (HPFS), which supported long file names and extended attributes; added support for more PCs and devices; had Dual Boot capability; included REXX and the Information Presentation Facility (IPF); could handle 4GB drives and 2GB files with 2TB total drive capacity.
OS/2 1.3 (Code name: Cutter)	12/90	Required 2MB memory minimum; added Adobe Type Manager; improved performance over OS/2 1.2.
OS/2 2.0 (Code name: Cruiser)	4/92	Required an 80386 processor or higher and 4MB minimum memory; Multiple Virtual DOS Machines (MVDM) replaced DOS box; added Win-OS/2 3.0. Boot Manager replaced dual boot, New System Object Model (SOM); added support for 32-bit programming model, virtual memory, 4GB memory segments, new user interface, and the Workplace Shell; included on-line tutorial, on-line help, on-line documentation, a new installation program, and applets.
XR06055 ServicePak for OS/2 2.0	11/92	Included bug fixes and new 32-bit GPI, 32-bit Windows, OS/2 display drivers, and new print drivers.
OS/2 2.1 (Code name: Borg)	5/93	Included new CD-ROM drivers, more SCSI drivers, 32-bit display drivers, printer drivers, and PCMCIA drivers; included Win-OS/2 3.1, MMPM/2, pen support, a 32-bit GPI, and new applets.
XR06100 ServicePak for OS/2 2.0	10/93	Included OS/2 2.1-level bug fixes, new display, (Code name: and printer drivers.
OS/2 2.1 for Windows (Code name: Ferengi)	11/93	Removed Win-OS/2 3.1 from OS/2 2.1; added new drivers for S3 displays.
XR06200 ServicePak for OS/2 2.1	2/94	Included bug fixes and new drivers for OS/2 2.1.
4XR06300 ServicePak for for Windows	4/94	Included bug fixes, new drivers; was OS/2 2.1 essentially the same as XR06200.
OS/2 for SMP	6/94	Supported multiple-processor systems (such as servers), and assigned multithreaded applications across servers; offered increased performance.
OS/2 3.0 (Code name: Warp)	10/94	Includes new 32-bit printer drivers, new audio, display, and PCMCIA drivers; requires less memory than 2.1—4MB RAM; supports Win32S; compatible with Windows 3.11 and Windows for Workgroups 3.11; has new DSOM object model, new tutorial, several Workplace Shell improvements; has improved install program and better performance; has improved applets in "Bonus Pak."

OS/2 2.1 appeared in 1993, bringing more fixes, more device drivers, and a 32-bit graphical programming interface. Windows support was upgraded to include Windows 3.1. But, in 1994, the Windows support was removed from OS/2. OS/2 2.1 for Windows took a different approach. Native DOS and Windows support could now co-reside with OS/2. OS/2 no longer had to emulate the Windows environment (nor did IBM have to pay Microsoft royalties for the use of Windows code).

OS/2 3.0 started beta tests in mid-1994. OS/2 3.0 (called Warp before its release) offered easier end-user installation, reduced memory requirements, performance improvements, Workplace Shell enhancements, and new applets in the form of a BonusPak.

What's next?

Workplace OS is intended to take OS/2 to new places and platforms as they evolve with, for example, the high-performance PowerPC processor. This Reduced Instruction Set Computing (RISC) CPU won't run today's OS/2, which was written for the 80386 and compatible processors. But, if you add a new microkernel layer of system software to the PowerPC and other machines, you can hide their differences and present a compatible interface to a new portable operating system. OS/2 for PowerPC is the first of a new series of OS/2-compatible operating systems that will eventually incorporate Taligent-developed technologies.

Identifying your system

You can find out exactly which version and level of OS/2 you are running. The `ver /r` command works only in a DOS or OS/2 2.11 window. On my system, this command brought up the following information:

```
The Operating System/2 Version
is 2.10
Revision 6.514
```

Listing 1: Information generated by the syslevel command.

```
C:\OS2\INSTALL\SYSLEVEL.GRE
IBM OS/2 32-bit Graphics Engine
Version 2.10      Component ID 562107701
Type W-2
Current CSD Level: XR02011
Prior   CSD Level: XR02011

C:\OS2\INSTALL\SYSLEVEL.OS2
IBM OS/2 Base Operating System
Version 2.10      Component ID 562107701
Type W-2
Current CSD Level: XR02011
Prior   CSD Level: XR02011
```

Table 2: Determining how OS/2 was installed.

Type	Description
O, 0-2, 0-2-288, W-2	OS/2 was installed from disks.
P, P-2, P-2-288, WP-2, PT	OS/2 was pre-loaded on your hard file.

These lines indicate that I'm running OS/2 2.1. (Revisions 6.307, 6.427, 6.466, and 6.543 are for OS/2 2.0; revision 6.514 is OS/2 2.1 or 2.1 for Windows; 6.617 is OS/2 2.11 or 2.1 with ServicePak XR06200 installed; and, revision 6.624 indicates OS/2 2.1 for Windows with ServicePak XR06300.)

The `syslevel` command can be run from an OS/2 window. It scans your hard disk and reports on OS/2 and its components, such as the Graphics Engine, MMPM/2 and LAN Server. When I ran the `syslevel` command on my system, the information shown in Listing 1 was produced.

The **Type** code indicates whether OS/2 was pre-loaded or installed from floppy disks. Table 2 indicates which type codes refer to which form of installation.

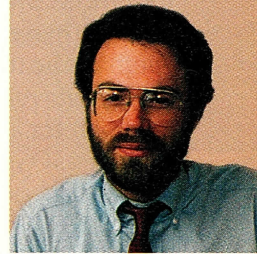
OS/2 improvements can be grouped into three broad categories: hardware, application support, and the user interface. Hard-

ware support includes things like more memory, more hard-disk storage, and, of course, new device drivers. Application support benefits OS/2 programmers and their applications and includes many new 32-bit programming functions. The user sees improvements to the graphical user interface, which includes OS/2's Workplace Shell, the applets, and a variety of on-line tutorials and reference information. See Table 1 for summaries of changes that occurred with each release. For more information on this topic a good source is the book by Stegenga and Jollans, called *OS/2 2.11 Power Techniques* (Que Publishing, 1994).

Dick Conklin is editor-in-chief of OS/2 Developer, contributing editor to OS/2 Magazine and author of three OS/2 books. He can be reached at CompuServe 76711,1005 or Internet os2mag@vnet.ibm.com.

Being Sensitive About Being Idle

MULTITASKING DOS APPLICATIONS UNDER OS/2 BY MARK MINASI



I started working with Warp II, the latest (as of early September) beta of OS/2. It's not very different from earlier OS/2s but, even so, it will be a good thing to have. The first thing you'll notice is quicker boot time and cleaner icons, as well as a better color scheme. Fellow journalist Wayne Rash once characterized the Workplace Shell as "out-of-focus Windows," and, painful as it was, I had to agree. The colors of earlier Workplace Shells, for some reason, were a bit fuzzy. This release, however, is faster and prettier. I do not know when IBM will be releasing it, but I'm hoping it will be available soon.

Unfortunately, many people only use OS/2 as a DOS and Windows launching platform, because of the terrible dearth of OS/2 applications. (Before I get letters on this topic, let me say that I know OS/2 applications are being created all the time, but the reality is that most corporate OS/2 users run Windows or DOS applications under OS/2.) OS/2 is, indeed, a "better DOS than DOS" in its multitasking abilities. You know what multitasking is all about—basically, making multiple DOS programs run at the same time.

You're probably already familiar with the basic DOS multitasking setting, **dos_background_execution**. This setting, which is set to "on" by default, tells OS/2's multitasking engine whether or not to run DOS programs when they are put in the background. It's odd that

**When DOS
programs have nothing
else to do, they go
harass something.**

it would be turned on by default, because most DOS programs shouldn't be allowed to run in the background. After all, they're interactive. If you're using DOS's WordPerfect 5.1 to edit a document and your OS/2 cc:Mail program wakes up and tells you that you just got some mail, you would naturally bring cc:Mail into the foreground. Doing so, however, has the side effect of putting WordPerfect in the background. You can't do anything with WordPerfect while you're typing in cc:Mail, so WordPerfect shouldn't multitask.

Back in the OS/2 1.0 days, running a DOS application in the foreground could slow down OS/2 in the background by a factor of 50 or more. So, I keep my eyes open when DOS programs are around. DOS programs burn up CPU time when they're in the background—CPU time that I'd like to spend on my foreground application. DOS applications are similar to hyperactive kids without Ritalin. When DOS programs have nothing else to do, they go harass something. For example, an early version of

Lotus 1-2-3 used to use up free time, asking the expanded memory manager "is any new expanded memory available? If there is, I'd like to use it"—over and over again. This type of action makes DOS programs seem very busy, when, in fact, they're only wasting time—CPU time.

OS/2's virtual machine manager (VMM) is built to determine when CPU time is being wasted. The most common cause of wasted time is a DOS program that continually polls the keyboard. For example, WordPerfect 5.1 polls the keyboard unless you invoke it with the **/nk** option. To the casual observer it looks busy—but only with "busy work." OS/2's VMM tries to determine which programs are using resources by periodically looking into their virtual machines to see what they're doing. If it finds that the program is spending a lot of time polling the keyboard, that program is denied any more CPU time until the next time the user brings that program back into the foreground. The process is called idle detection.

The OS/2 VMM periodically checks each virtual DOS machine (VDM) to see if it's polling the keyboard. Why periodically? Because it takes up precious CPU time to stop and peek into a VDM. Also, it's not a good idea for the VMM to check up on the DOS program too often. The VMM could get unlucky and catch the DOS program on an occasion when it is legitimately reading

the keyboard, causing the VMM to unfairly "freeze" the DOS program.

You can fine-tune that monitoring process with the **idle_sensitivity** setting. This setting allows you to set each application to a percentage value that will determine the point at which the application is considered idle. OS/2's virtual machine manager periodically checks each virtual DOS machine, noting how often the DOS virtual machine polls the keyboard. The VMM compares the percentage of times the VDM polled the keyboard to the **idle_sensitivity** percentage. If the actual percentage of polls is greater than the **idle_sensitivity** number, the VMM stops giving CPU time to the DOS machine. For example, if the **idle_sensitivity** value for WordPerfect's virtual machine is the default value, which is 75 percent, and the VDM polls the keyboard 45 percent of the time, OS/2's VMM will continue to give WordPerfect

CPU time. However, if you reduce the **idle_sensitivity** value of the WordPerfect virtual machine to 40 percent, WordPerfect would freeze up in the background and wake up again when you brought it to the foreground.

You can determine the percentage by using the OS/2 Pulse program. Open up a DOS VDM and window it. Make sure that **dos_background_execution** is on (although it's set to on by default, so it'll probably be on already), start up the OS/2 Pulse program, which you'll find in the Productivity folder (which is in the System folder), put Pulse out of the way so you can see it when the DOS Settings dialog box appears, and click on the title-bar icon on the DOS program. You'll see "DOS Settings" on your pop-up menu. You can change the DOS settings on the fly for a DOS VDM. Changes will not be saved, however, so any settings that you

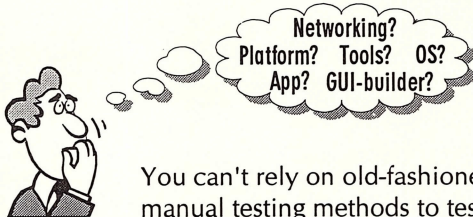
want to keep should be re-applied to the program object once you've exited the DOS program.

If you've arranged Pulse correctly, you'll be able to see it while the DOS Settings dialog is showing. With most DOS applications, the Pulse line will be set at the top, indicating 100 percent CPU utilization. Your DOS application is using all the CPU time to be idle! Click on **idle_sensitivity** and slowly scale down the percentage. Drop the percentage and wait a second to see what Pulse shows. If nothing happens, drop the percentage a little more. Eventually, you'll find the critical value that makes Pulse drop nearly to the baseline. You have now found the critical value for that DOS application.

Sometimes, you'll want to make OS/2 insensitive to idleness. For example, in some cases, if you are trying to print from WordPerfect while it's in the background, it can stop printing after a few minutes, even though the print job wasn't finished. WordPerfect tries, like most DOS applications (I'm not picking on WordPerfect here, it's just a convenient example), to do many things at the same time. As a result, it prints for a short while, goes back to check the keyboard, prints a little more, checks the keyboard again, and so on. If OS/2's VMM happens to get unlucky when it checks WordPerfect for keyboard polls, the VMM may incorrectly conclude that WordPerfect is idle. You can set **idle_sensitivity** to 100, essentially shutting off the VMM monitoring process. A quick peek at Warp II's DOS Settings shows that you can set the relative priority of a given VDM!

Mark Minasi has been a consultant and educator in the fields of advanced PC operating platforms and PC technology since 1984. He is a contributing editor for Compute, BYTE, and OS/2 Magazine. You can contact him at CompuServe 71571,264 or Internet mminasi@access.digex.net.

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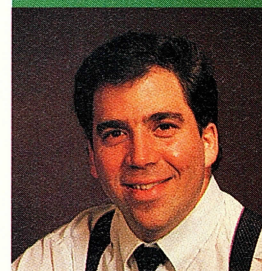
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Ready on the Launch Pad

CROWDED LAUNCH PAD, MULTIPLE COM PORTS, ASSOCIATIONS, ADDING DISKS, AND MORE... BY DAVID REICH



LAUNCH PAD CROWDING

Q: I like the new OS/2 3.0 Launch Pad, but I've put so many things in the Launch Pad that it's grown and consumed most of my desktop. I may as well just put all the objects on the desktop, which seems to defeat the purpose of the Launch Pad. Is there a way I can make the Launch Pad smaller and still hold the things I want?

A: You can add many things to the Launch Pad without it taking up so much space. You can open the Settings notebook and choose the Small Icons setting or you can use the drawer function (the bar over, or to the side if you have the Launch Pad in vertical display mode, of the icons). You can drag and drop items to this bar or drawer instead of to the main part of the Launch Pad. You'll see no visible change to the Launch Pad when you do this, because you are placing the objects in the drawer instead of on the main Launch Pad window. To open the drawer, simply click on the bar.

You may want the drawer to close immediately after you open an object from it. You can make this happen with the Close Drawer After Object Open setting, which can be found in the

Is there a way I can make the Launch Pad smaller and still hold the things I want?

Settings notebook. Using the drawers allows you to store many more objects in the Launch Pad without it growing to an inconvenient size.

COM3 AND COM4

Q: OS/2 works just fine on my ISA system when I'm using the first two serial ports (COM1 and COM2), but I also have COM3 and COM4. How can I get COM3 or COM4 to work on my OS/2 system?

A: To enable COM3 or COM4 on an ISA system, place the line:

```
device=x:\os2\com.sys ␣  
(n,a,i) (n,a,i)
```

in the *config.sys* file. X is the drive from which OS/2 is booted, n is the COM port number that you are configuring, a is the COM port

input/output (I/O) address (for example, 03E8 and 02E8), and i is the IRQ level set for that port. For example, to specify that COM3 is at address 03E8 on IRQ5 and that COM4 is at address 02E8 on IRQ10, use the following statement (assuming that OS/2 is installed on drive c:):

```
DEVICE=C:\OS2\COM.SYS ␣  
(3,03E8,5) (4,02E8,10)
```

WRONG MEDIA

Q: When I purchased my copy of OS/2, I received the 3 1/2-inch disk version, but my computer's a: drive is 5 1/4-inch and the b: drive is 3 1/2-inch. What can I do?

A: You have several options. First, you can reconfigure your computer so that the a: drive is the 3 1/2-inch disk drive. You will probably need to switch cables to do so. Usually, the cables can be easily switched, but you have to make sure you tell the computer what you did. You should have a setup program or disk that came with your computer that will let it know. Sometimes, this program is accessed with a special key sequence when the computer is starting up. Other times, it is found on a special disk that came

with the system. You may need to call your dealer to find out how to access this program.

You can also contact the IBM support Bulletin Board or CompuServe to obtain a special installation program that allows OS/2 to be installed from the *b:* drive or the 3½-inch. The file is called *instlb.zip*, and can be found in the OS2SUPP forum, section 17.

DRAG-N-DROP PRINTING

Q: When I drag a text file onto a printer object and drop it, a window pops up that asks me if it is plain text or printer-specific. What does that mean and why does it ask every time?

A: The OS/2 printer drivers translate different types of files into the language each printer understands. Applications query the selected printer and write to a device-independent Presentation Space (PS), which is associated with a Device Context (DC), which is, in this case, the appropriate printer driver. This PS-DC association allows applications to determine what type of printer is attached, because the association with the DC does the translation.

No application is involved when you drag a file to a printer. The printer driver has no way of knowing what type of file it is, whether it is in the printer's language, a plain-text file, or some specially-formatted file, such as a Lotus 1-2-3 spreadsheet or a DB2/2 database. In simple drag-and-drop printing, the system can perform only the most generic printer translation. You're asked if it is plain text or printer-specific, because if the file is printer-specific, all the system needs to do is pass it to the printer without any translation. If the file is plain text, the system will create a PS and a printer DC, draw this plain text to the PS,

OS/2 can RUN DOS PROGRAMS USING HIGH-RESOLUTION GRAPHICS, BUT NOT WHEN THEY'RE RUNNING IN A DOS WINDOW.

and pass it to the printer. The system cannot assume the file format of other types of files, so drag-and-drop printing of any other file types (such as spreadsheets) must be provided by the application programs.

SUSPENDED DOS

Q: I have some DOS programs that run fine in a full-screen session, however, when I try to run them in a DOS Window, the system says the program is suspended. Why is this?

A: The program you are trying to run probably uses high-resolution graphics. OS/2 can run DOS programs using high-resolution graphics, but not when they're running in a DOS Window, because of the way many DOS programs access video hardware. OS/2 "virtualizes" many parts of the system, making DOS programs think they are actually manipulating hardware, when, in fact, OS/2 is intercepting the DOS commands, translating them, and sending them to the hardware. In a full-screen environment, much more can be done for DOS programs. But, in a DOS Window, programs are more restricted, restricting some features, such as high-resolution graphics.

If you try to run a program in a DOS Window and see the message from OS/2 that the program has been suspended, you can terminate the program and start it again in a full-screen session. For an even quicker solution, use <Alt-Home> to take the DOS Window and make

it a DOS Full-Screen, allowing the program to run.

ADDING DRIVES

Q: I am adding a hard drive to my system. Do I need to do anything to tell OS/2 2.1 that I have another physical hard drive connected to my system?

A: It depends on whether the new drive will be your boot drive or a second or third hard drive in your system. In the majority of cases, people add hard drives after the boot drive—not to replace it. If this is the case, you need to first physically install the drive. No preparation is needed before taking that step. In fact, you can install the drive and not do anything with it and it will not affect system operation.

Once the drive has been physically installed in your computer and you've restarted your system, you will need to run FDISK to create partitions and make the drive usable in your OS/2 system. You may, however, have to do certain things before running FDISK, depending on your current configuration and the type of drive you're installing. For example, if you currently have an IDE hard drive and you're adding a SCSI hard drive and controller card, you'll have to make sure that the correct SCSI drivers are loaded in *config.sys*. Drive manufacturers produce many types of drives. You should follow the instructions that came with the drive.

To determine if you have all the drivers loaded properly and the

drive installed correctly, run FDISK (or FDISKPM). Make sure that you reboot the system after all updates to *config.sys*. If the drivers are installed correctly, you will see the appropriate number of hard drives on the FDISK screen. If you have installed a second drive, but only see one in FDISK, you need to go back and check the drive and driver installation.

Once you have completed these steps and can see all the drives that are physically resident in your computer, it's time to partition the new drive. You need to consider how the drives will be initialized by the system (hardware actually assigns drive letters). For example, your old drive may be configured with a *c:* primary partition for booting OS/2 with *d:* and *e:* extended logical partitions for programs and data. If you install the new drive as the second physical drive in the system, the *c:* primary partition on the orig-

inal drive will remain as the boot partition. If you create a primary partition on the second physical drive, it will come up as your *d:* drive. What was *d:* and *e:* on the original drive (the two extended logical partitions on the first drive) will become *e:* and *f:* now.

The easiest way to install a new drive is to set it up as one or more extended logical partitions and place it at the end of a hard-disk chain. This way, your OS/2 *c:* boot partition remains the same and you don't have to contend with changing drive letters in command files or program-reference objects for the other drives. When you configure the disk with FDISK (or FDISKPM), you will set up the drive as one or more extended logical partitions. You will need to exit FDISK, shut down your system, and reboot to make the changes active.

Once you have FDISKed the drive, you can format it and start

using it for data and/or programs. Make sure you format it with the file system you want, as FAT will be the default if you type **format e:** (assuming *e:* is the new partition you've created). If you want to format HPFS, you will need to type **format e: /fs:hpfs** (again, assuming *e:* is the new partition you've created). The new disk is now ready for use.

DEFAULT PROGRAM OBJECTS

Q: I want to put all my spreadsheet files in one folder so that when I click on one, Lotus 1-2-3 is launched. How would I go about getting all my spreadsheet files into one folder and associate the files to the program?

A: You need to understand that a folder is the Workplace Shell's way

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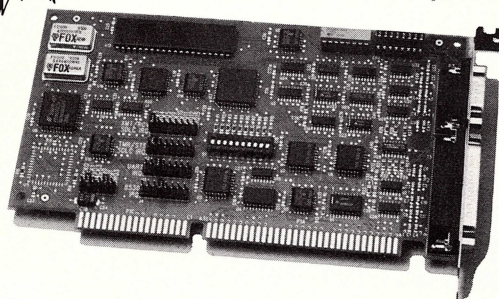


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of looking at a subdirectory. The objects you see in folders represent things or objects in the system. If you open the Drives object, the objects you see in a drive are Workplace objects that represent files on your disk. So, by traversing your way down the Drives object and the subfolders (which are really just subdirectories in the file system) you can get to the folder (subdirectory) that holds your spreadsheets.

If all your spreadsheets are not in the same directory, you can put them there by copying them to a single subdirectory or by dragging them to a single folder through the shell. You can also drag shadows of the objects representing your spreadsheets to this single folder. Note that the file system knows nothing about shadows. Shadows are a Workplace Shell construct. You can move the shadows without affecting the original object or file. Using shadows, you can put the objects in a single folder without actually moving the files.

You now have a set of objects in one folder that represent your spreadsheet files. The next step will associate all files of a given extension to your spreadsheet application—in this case, Lotus. Determine the real file names of the spreadsheets, record all possible file-name extensions, and go to the program-reference object you use to invoke Lotus 1-2-3. Open the Settings notebook and select the Association page. On the entry field labeled New Name, enter a file extension. For example, for .wgl file extensions, enter *.wgl and press the Add push-button. Repeat this step for all file extensions. Now, close the Settings notebook.

From this point on, when you open a spreadsheet object (by double-clicking on it) that represents a file for which you've created an association, 1-2-3 will start, and the appropriate file will be loaded.

Most of the IFSs you come across are not just IFS files that you install.

ADDING HPFS SUPPORT

Q: All documents I have seen, including on-line help, talk about the file *hpfs.ifs*. My *config.sys* file, however, only has the following IFS line:

```
IFS=C:\OS2\CDFS.IFS /Q
```

Is the HPFS line similar? I could not find any explanation about the /q argument. Can I REM out* this instruction, since all of my hard disks are FAT? If so, will I gain some memory?

A: IFS stands for Installable File System. Since the 1.2 version of OS/2, the operating system has supported user-installable file systems, which are, of course, programs and extensions to the system, but which are installable by users. Most of the IFSs you come across are not just IFS files that you install. It's likely that they come with installation programs. The installable file system you refer to is one that comes with OS/2 for CD-ROM drives, the OS/2 CD-ROM File System (*cdfs.ifs*). It was installed either because OS/2 detected a CD-ROM drive when you installed the system or because you manually selected CD-ROM support when installing (or later on, through Selective Install). If you REM out that IFS statement, you'll lose access to your CD-ROM drive.

HPFS is the High Performance File System and is also implement-

ed as an IFS (as opposed to FAT, which is built right into the OS/2 kernel). Its file name is *hpfs.ifs*. Your assumption that it requires memory is correct if the *config.sys* file causes it to be loaded.

If, when installing, you formatted your boot partition with HPFS, or installed HPFS manually in the menus, the *hpfs.ifs* line will be in your *config.sys*. If you remove it and have HPFS-formatted drives, you will be unable to access them. If, however, you have no drives formatted with HPFS, and you have the line:

```
IFS=C:\OS2\HPFS.IFS
```

in your *config.sys*, you should add REM to the beginning of the line to inhibit the IFS from loading, which will indeed save you some memory.

If you don't have the *hpfs.ifs* line in *config.sys* and want to add HPFS support, the best thing to do is to open the Selective Install object, which resides in the System Setup folder in the OS/2 System Folder, and use that program to selectively add HPFS support to the system. You can do the same for the CD-ROM support mentioned earlier if you did not initially install that support, but have since added a CD-ROM drive.

Of course, if you don't want to use HPFS, and the *hpfs.ifs* line isn't in your *config.sys*, congratulations—you're all set.

*REM stands for remark. When the word REM is placed at the beginning of a line, it causes the line to be ignored when *config.sys* is loaded)

David Reich, a contributing editor to OS/2 Magazine and author of *Designing OS/2 Applications*, has been with the OS/2 development team since 1987. Questions can be addressed to David via CompuServe 76711,632 or Internet speedracer@vnet.ibm.com.

End Notes cont'd from p. 80

chapter explores potential problems ("Ironing Out the Wrinkles") and a lively appendix covers both installing and uninstalling OS/2. The section on uninstalling illustrates the authors' refreshingly irreverent style:

"There's something about OS/2 that brings out the tinkering impulse in some people. If you are one of those people, you may tinker to the point where you screw things up completely and have to reinstall. Major bummer. Fortunately, uninstalling OS/2 is a great deal easier than installing it..."

Crawford & Russel are equally up front discussing the "Programs that Come with OS/2" (Chapter 8). The "free" applets are divided into "useful," "fun," and "without redeeming value." Among the latter is the OS/2 Notepad, which invokes the scathing tip: "Don't confuse this worthless thing with the Notepad in Windows. They are two

completely different kettles of fish. The Windows Notepad is no great shakes, either."

This book turns out to be a highly-readable, technically accurate guide to OS/2, regardless of your background. The value of prior Windows know-how is amusingly diluted by a table on the inner pages comparing the keystrokes for various Windows and OS/2 tasks. Of the nine tasks listed, only three use the same keystroke combinations (Find Help, Close a Window, and Save a File).

The layout and typography are generally helpful, including shaded boxes for Tips, Notes, and Instant Experts and lots of crisp tables and screen shots. One minor quibble I have is that sentences, such as "Most objects have a Create another option on their pop-up menu" would be more legible if the option name, "Create another," appeared in bold or italics. And, thanks to the

Index King (Ted Laux), the book also serves as both a tutorial and a reference guide.

If you have any Windows users on your "<= \$20.00" Christmas prezzy list, why not help them "move up?"

RESOURCES:

OS/2 For Windows Users (\$19.95)

by Sharon Crawford & Charlie Russel
Sybex, San Francisco, CA, 1994

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Stan Kelly-Bootle started computing on EDSAC I at Cambridge over 40 years ago and has written at least 11 books. His Child of Devil's DP Dictionary is in the MIT Press, Spring 1995 Catalog. Stan's "Devil's Advocate" column in UNIX Review has been running since 1984. He can be reached on Compu-Serve (70323,1560) or Internet (SKB@CRL.com).



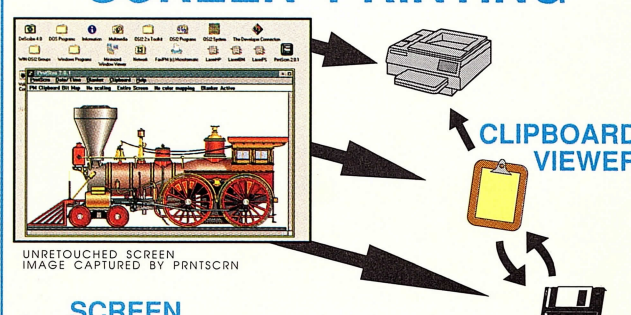
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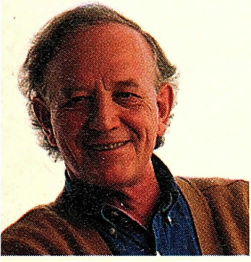
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Moving Up...

UPGRADING IN THE "B FOR A USERS" TRADITION BY STAN KELLY-BOOTLE

Sharon Crawford and Charlie Russel's *OS/2 for Windows Users* from Sybex is in the long-running tradition of *B for A Users* books. The format implies a quorum of A users who are motivated and poised to embrace B. I'm not sure when this template first tickled the market. St. Paul's epistles certainly offer *Christianity for Torah Users*, but no doubt earlier examples exist—perhaps a series of tablets called *Hittite for Proto-Indo-European Users*?

Most computer titles of this ilk make good sense. Take the highly successful *Modula-2 for Pascal Users*, for example. The intended readers are well-primed and the author can assume an appropriate knowledge base without boring their socks off. Further, *Modula-2* is Niklaus Wirth's subtle extension of his earlier Pascal language, so the book offers an immediately recognizable transitional guide for the very folk seeking enlightenment. Oberon and *Modula-3* are now on the way to replacing *Modula-2*, so further iterations of this incremental strategy are expected.

Recent *C++ for C Users* books are particularly effective examples of this marketing ploy—if you “know” C, you are probably keen to “move up” to C++—and the authors can “leverage your existing skills.” One is reminded of those helpful “You are here” roadside maps, designed to get you someplace else and more desirable.

Unfortunately, not every *B for A Users* title exhibits the ideal didactic relationship between A and B. *DOS for CP/M Users* made sense

(briefly) in the early 1980s, but *CP/M for DOS Users* was hardly ever viable. My older readers may recall the Zen title *ALGOL 68 for ALGOL 68 Users* that sold only ten copies. *DOS 4.0 for DOS 3.1 Users* does have a cynical “moving up” charm, but *BASIC for LISP Users* is entirely unclear on the concept.

I view each success of a sensible *B for A Users* guide as a welcomed antidote to the “Books for the Baffled” genre, such as *DOS for Dummies* and the new pandemic of reader debase-ment—*The Complete Idiot's Guide to the Internet*. Surely we have a surfeit of fools surfing the InfoBahn.

Where does *OS/2 for Windows Users* fit in the range of *B for A Users* titles, which Fritz Spiegl has dubbed “from the sublime to the ‘cor blimey’?” Without hesitation, I place it near the top of the scale. Crawford & Russel, clearly well-versed in both operating systems, deftly employ a post-incremental strategy throughout the book, expounding OS/2 in terms of its differences from, and improvements over, Windows.

The potential readership is undoubtedly “out there.” Saganic billions and billions of potty-trained Windows users have already mastered the so-called intuitive GUI basics, the click’n’drag of the mouse, and the pulling down of the menu. Moving from Windows to OS/2, from GUI to OOU, is rather like revving up from C to C++. For example, with relatively minor tweaks, OS/2 “does” Windows, just as C++ “does” C. In both cases, you can set the pace of your transition while retaining your investment in

training and code. You can migrate all your Windows applications to OS/2 and “reuse” your hard-won skills. Indeed, with OS/2 for Windows, you get to reuse your installed Windows systems code, depriving Microsoft of much needed royalties. Then, gradually, you can explore the advantages of OS/2 and convince yourself that the extra hard-disk space is earning its keep.

But, compared with the move from C to C++, the transition from Windows to OS/2 seems to present a deeper challenge: the vexing, subjective, market-driven problem of *incentive*. The authors’ introduction suggests some valid reasons why a Windows user should look seriously at OS/2:

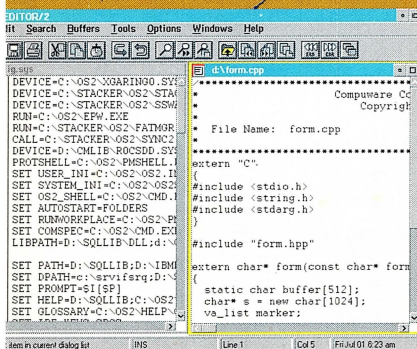
“Maybe you’ve changed jobs (or your company has changed operating systems) and learning OS/2 has become an economic necessity. Perhaps you’ve seen ads offering OS/2 for Windows at a price that’s hard to ignore. Or perhaps you’re just an adventurous soul who’s read about OS/2’s technical wizardry and you want to try it out...Your DOS programs will run better and your Windows programs will run just as well (and in some cases better). And if you’re able to use native OS/2 programs, you’ll see gains in performance that will amaze you.”

Is this column preaching to the upgraded? If you have not yet moved up and are so tempted, you will benefit greatly from *OS/2 for Windows Users*. Before making the plunge into OS/2, splash a mere \$19.99—can you believe it costs less than \$20? A great (that is, honest)

End Notes cont'd on p. 79

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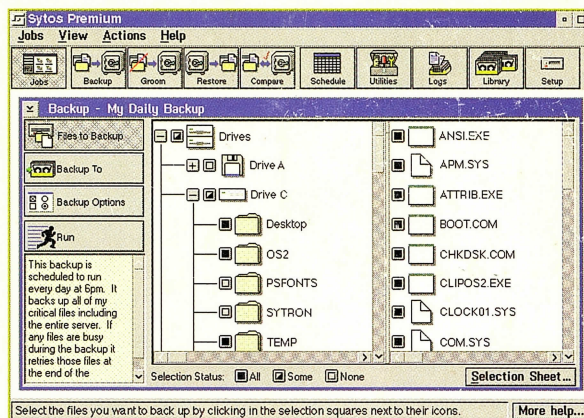
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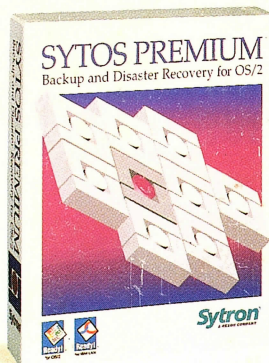
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